بسم الله الرحمن الرحيم

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Transurethral Resection of the Prostate
Criteria of Selection of the Patients, Anaesthesia, and Postoperative Course in Soba University Hospital
(1999-2003)

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بسم الله الرحمن الرحيم

وإذا ما إزدت علماً
زادني علماً بجهلي

(الإمام الشافعي)

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Dedication

To the soul of my mother

To the soul of my father

To my family

ACKNOWLEDGEMENT

I am extremely grateful to professor Abdl Rauof Sharfi.
Who was very patience in advising and directing, courteous in dealing and he did not deny any effort to help me to bring out this study in a successful manner.

I wish to thank Mr. Seif-Edin M. Nour For his valuable advices.
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I owe special gratitude to the library staff in Ibn Sina hospital and faculty of medicine in U of K. who are working silently behind the curtain .
I also wish to thanks my wife for her patience and kind help.

Dr Fawzi Mahgoub
Oct. 2004

List of Abbreviations

BPE or BPH = Benign prostatic enlargement or hyperplasia

BPO	Benign Prostatic hyperplasia
Ca	Carcinoma
DRE	Digital rectal examination
DVIU	Direct vision internal urethrotomy
LUTS	Lower urinary tract symptoms
PSA	Prostatic specific antigen
RCTs	Randomized clinical Trials
STD	Sexually transmitted disease
SUH	Soba university hospital
TRUS	Tranrectal ultrasonography
TURBT	Transurethral resection of Bladder Tumour
TURP	Transurethral resection of the prostate
UOFK	University of Khartoum
U/S	Ultrasonography
UTI	Urinary tract infection
Veru	Verumonatnum

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Abstract

This study was carried out to determine the indications and criteria of patients selection for TURP and to reviews, type of anesthesia, hospital stay and whole post operative course including the complication in Soba University Hospital (SUH) in the period (1999 – 2003).

One hundred patients who had undergone TURP in (SUH) in the period of the study. All the records were retrospectively studied.

The mean age was 66.7 years. Duration of symptoms range between one week and 20 years with a mean of 2.33 years. LUTS were observed in all patents. Irrigative symptoms were predominate urine retention noted in 40%, while haematruia in 19% of the patients.

The most important guidelines for patients selection were size of the prostate which was small to moderate in most of the patients .

The most common indications for TURP was LUTS in combination with other symptoms in 63%, while LUTS alone was the indications in 37% of the patients.

Preoperative preparation were done for all patients, with pre-anaesthesiatic evaluations. The most common type of anesthesia used was regional (spinal or epidural)

in (92%) of the patients there were no complications observed due to anesthesia.

There were no death in the study. Intraoperative complications occurred in 5%, immediate post operative complication occurred in 13%, and late postoperative complications occurred in 33.9%. of the patients.

The commonest complications noted were bleeding required transfusion in 4%, infection in 6%, TUR syndrome in 1%, urine retention in 3%, and urethral stricture in 6.4% of the patients.

The catheter was removed within the first 48 hours post TURP in most of the patients (59 %). Most of the patients discharged from the hospital between 4 – 6 days (56 %).

Incidental finding of the prostate reported in a rate of 7% of the patients.

This study showed that TURP accompanied with very Low morbidity and no mortality. Post operative catheterization and hospital stay were only few days. So TURP remain the golden procedure for treatment of BPH.

ملخص الدراسة

المقدمة :

تعد عملية إزالة غدة البروستات عن طريق مجري البول كأحد الخيارات الجراحية لعلاج تضخم البروستات الحميد لدي الذكور. وقد بدأ تطوير هذه الطريقة لإزالة البروستات ما بين العام 1920م و 1930م بالولايات المتحدة الأمريكية ومنذ العام 1970م وحتى يومنا هذا شهدن صناعة أجهزة ومعدات مناظير الجهاز البولي السفلي تطوراً سريعاً وملحوظاً حتى أصبحت إزالة البروستات عن طريق مجري البول تجري بطرق فنية وتقنية متقدمة. وبذا صارت الطريقة المثلي للعلاج الجراحي لتضخم غد البروستات الحميد في كثير من أنحاء العالم. كما أنها تستخدم في إزالة الأعراض الانسدادين في حالة سرطان البروستات.

الأهداف:

أجريت هذه الدراسة لمعرفة دواعي إجراء ومعايير اختيار المريض لعملية إزالة غدة البروستات عن طريق منظار البول السفلي. وايضاً لمراجعة نوع التخدير المستعمل ومدة المكوث بالمستشفي وكل مسار نتائج ما بعد العملية بما فيها المضاعفات على المدى القريب والبعيد. وذلك بمستشفي سوبا الجامعي بالخرطوم.

طريقة البحث:-

شملت الدراسة مائة مريض أجريت لهم عملية إزالة غدة البروستات عن طريق مجري البول بالمستشفي في الفترة من يناير 1999م وحتى ديسمبر 2003م . وتم مراجعة سجلاتهم وتحليل المعلومات.

نتائج البحث:

تم إجراء العملية ل97 مريضاً كعلاج لتضخم البروستات الحميد ولثلاثة مرضي لإزالة الأعراض الانسدادية بسب سرطان البروستات.

كان متوسط الأعمار للمرضي 66,7 سنة وتراوحت فترة الأعراض من أسبوع الى 20 عاماً بمتوسط 2,33 سنة.

وقد سجلت أعراض المجرى البولي السفلي في كل المرضي وهي تشمل :

1- الأعراض المثيرة وتتمثل في كثرة التبول وسجلت في 88% من المرضي – الشعور بحرقان البول وسجل في 86% - واستعجال خروج البول في 63%- وقد يتسبب الاستعجال في صعوبة الحكم في البول وسجل في 31%.
2- الأعراض الانسدادية تتمثل في ضعف جريات البول سجل في 70%- التنقيط بعد الانتهاء من التبول وسجل في 57%- بطء في ابتداء التبول وسجل في 55% - وتقطع جريان البول وسجل في 12%.

وقد غلبت الأعراض المثيرة على الأعراض الانسدادية في معظم المرضي. وايضاً من الأعراض الأخرى الأقل شيوعاً احتباس البول ولوحظ في 40% من المرضي وخروج البول مصحوب بدم ولوحظ في 19%.

تم استعمال إجراء الفحص الإصبعي عن طريق المستقيم للبروستات، الموجات الصوتية البطنية ، منظار مجري البول والمثانة ، وتحاليل وظائف الكلي كإجراءات تشخيصية في معظم المرضي.

الخلاصة :

أوجدت الدراسة بأن أهم دواعي إجراء عملية إزالة البروستات عن طريق مجري البول (الاحليل) كانت :

1. أعراض المجري البولي السفلي مصحوبة بدواعي أخري (مثل احتباس البول – خروج البول مصحوب بدم- خمج مجري البول المتكرر- ووجود حصوة بالمثانة) وقد سجلت في 63% من المرضي.
2. أعراض المجري البولي السفلي بمفردها وسجلت في 37% من المرضي. أهم المعايير التي تم بها اختيار المرضي كانت :

- حجم البروستات يتراوح بين الصغير والمتوسط في معظم المرضي.

- ظهور التضخم مرة أخري مع دواعي إزالته للمرضي الذين أجريت لهم عملية إزالة البروستات سابقاً.
- علاج ضعف الدم واستقرار مستوي الضغط والسكر لمرضي الضغط والسكر وعلاج التهاب مجري البول وذلك قبل العملية.

تم تحضير المرضي قبل العملية وتم تقييم ملائمة حالتهم للعملية والتخدير. تم استعمال المخدر النصفي في معظم المرضي (92%) لم تلاحظ أي مضاعفات بسبب التخدير.

لم تسجل أي وفيات أثناء وبعد العملية. مضاعفات أثناء العملية سجلت معدل حدوث 5% ، مضاعفات ما بعد العملية على المدى القريب سجلت بمعدل 13%، ومضعفات ما بعد العملية على المدى البعيد سجلت بمعدل 33,9%.

أما أهم المضاعفات التي حدثت فكانت :

1) نزيف احتاج لنقل دم بنسبة 4%.
2) خمج ما بعد العملية ولوحظ بنسبة 6%
3) أعراض زيادة حجم السوائل بالدم حدثت بنسبة 1%.
4) احتباس البول بنسبة 3%.
5) وعلى المدى البعيد ضيق مجري البول (الاحليل) حدث بنسبة 6,4%

تم إزالة القسطرة البولية خلال اليومين الأوائل بعد العملية في معظم المرضي (59%) وكما تم خروج معظم المرضي من المستشفي في فترة تتراوح بين 4 الى 6 أيام بعد العملية (56%).

تم تسجيل وجود سرطان البروستات عن طريق المصادفة بمرضي تضخم البروستات الحميد بمعدل 7%.

هذه الدراسة بينت أن مضاعفات عملية إزالة البروستات عن طريق المنظار قليلة جداً كما انه لا يوجد وفيات . كما أن مدة تثبيت القسطرة بعد العملية والمكوث بالمستشفي لا يتعدي أيام قلائل ، وهذا يوضح أن هذه العملية مازالت هى الطريقة المثلي لعلاج تضخم البروستات الحميد.

Chapter One

BACKGROUND

The Department of urology in Soba hospital was established in 1975 with the opening of Soba University hospital.

Few months following this endourology unit was established. The first transurethral resection of the prostate

(TURP) was performed in Soba University hospital in 1975. At the beginning there were no anaesthestic facilities in the cystoscopy room, and all the procedures with general or regional anesthesia were performed in the main theater complex, moving all the scopes to the main theatere.

In the early days the number of TURP performed in Soba University Hospital was limited, because the available operating time was limited in the main theater complex.

In the year 1991 the endourology unit was supplied with anaesthestic machines and an anesthiologist, since that time the number of TURP done showed a considerable increase.

In the year 2001, and with great efforts of Professor Sharfi, Mr. Sief ELdin Mohamed. Nour, and the administration in Soba university hospital, rehabilitation and extension in the department of urolog

took place. By the and of the year 2003 a new theatre room for open

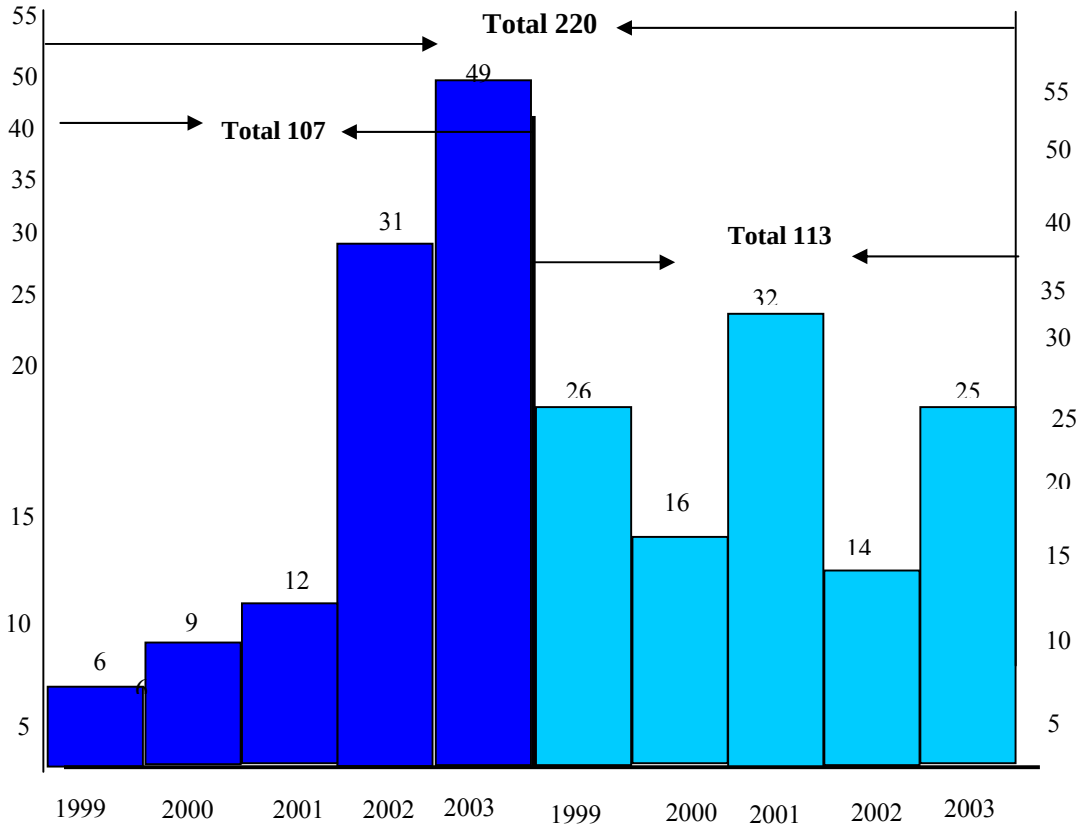
surgery was established, followed by introduction of an urocam video camera for endourology, appointing paramedical staff and the rest of the armamentarium needed for the department.

This renovation in the department of urology with increase in the number of consultant urologists, during the last three years, promoted the quality and quantity of procedures. That was clearly reflected by two to three folds increase in the number of TURP performed in the last two years[(1)].

The figure below shows the total number of prostatectomy done within the period (1999-2003) with comparison between open and transurethral prostatectomy [(3)].

Open prostatectomy fluctuating in frequency.

TURP Took step ladder manner.



TURP **OPEN PROSTATECTOMY**

INTRODUCTION

Benign prostatic Hyperplasia (BPH) and prostate adenocarcinoma are the two major neoplasms affecting the human prostate. Together these two diseases constitute a major proportion of pathologies affecting the urological system [(3)].

Benign prostatic Hyperplasia (BPH) is seldom life threatening. It can have a significant impact on aging males' quality of life. In the majority of men affected, the disease produces urinary symptoms that are slightly inconvenient in some patients, and it could be more bothersome in others or with development of serious sequel, that may necessitate therapeutic intervention.

The treatment of this condition should be preceded by good evaluation, assessment of symptoms and signs, proper investigations, and to find out any complications so as to select the appropriate type of treatment.

Transurethral resection of the prostate (TURP) is the most common surgical procedure for treatment of benign prostatic hyperplasia in USA, and it is clearly the most effective treatment of BPH[(4)]. The TURP procedure can also be used as palliative method for ca prostate with obstructive symptoms[(3)].

TURP is a popular procedure nowadays with high utilization in wide area in the world[5]. Many comparative studies have been done for the procedure versus other surgical modalities (Open prostatectomy or other transurethral minimal invasive procedures) showed that TURP remains the surgical standard to which other interventional therapies are compared [6].

In the Sudan there are two studies which looked into the management of Benign prostatic Hyperplasia: In the year 1998 Baoum and in 2002 Khalafalla A[7,8]. They found that TURP procedure was accompanied by the least complications and short hospital stay.

Indications for prostatectomy:-

Indications for prostatectomy depend on many factors:-

1- In Large adenomas retropubic prostatectomy is preferred.

2- Moderate sized adenomas can be removed by TURP or open methods. The choice between the two methods depends upon the surgeon's preference and his skill to perform transurethral resection.

3- Transurethral resection of the prostate (TURP) is indicted in :-

- Small and moderate size enlarged prostate.

- Glands diagnosed clinically as fibrosed from previous prostitis.

- Obstructing prostatic carcinoma [9,10].

Transurethral resection of the prostate started in the Urology Unit of Soba University Hospital more than twenty years ago. Since that time no critical review was carried to evaluate this procedure.

This study reviews the indications for TURP, type of the anesthesia, the hospital stay and its complications.

ANATOMY OF THE PROSTATE

The normal prostate is about 18 gm and its measurers about 3 cm in length, 4cm in width and 2cm in depth.

Although it is ovoid in shape, the prostate is referred as having anterior, posterior and lateral surfaces with a narrowed apex inferiorly and broad base superiorly that it continues with the base of the bladder.

The prostate is traversed by the prostatic urethra. The apex of the prostate is continuous with striated urethral sphincter.

Anatomical Relations: -

The prostate gland is enclosed by a capsule composed of collagen elastin and abundant smooth muscles. Posteriorly and laterally this capsule has an average thickness of 0.5 mm. On the anterior and anteriolateral surface of the prostate the capsule blends with the visceral continuation of endopelvic fascia.

Towards the apex the puboprostatic ligament extends anteriorly to fix the prostate to the pubic bone.

Laterally the prostate is cradled by the pubococcygeal portion of the levator ani muscle and is directly related to its overlying

endopelvic fascia. Posteriorly, loose areolar tissue defines a thin plane between denonvillier's fascia and the rectum.

Structure and histology:-

The prostate is composed of approximately 70% glandular elements and 30% fibromuscular stroma.

The urethra runs the length of the prostate and is usually closest to its anterior surface. It is lined by transitional epithelium which my extend into the prostatic duct.

A urethral crest projects inward from the posterior midline, runs the length of the prostatic urethra and disappears at the striated sphincter. On either side of the crest a groove is formed into which all glandular elements drain at its mid point. The urethra turns approximately 35 degrees. This angulations may vary from zero to 90 degrees. This angle divides the prostatic urethra into proximal and distal segments which are anatomically and functionally discrete.

In the proximal segment the circular smooth muscle thickens to form the involuntary internal unearthly sphincter per urethral glands at this area incriminated as one of the sites of origin of BPH. Beyond the urethral angle all major glandular elements of the prostate open

into the prostates urethra. The urethral crest widens and protrudes as the verumontanum.

A small slit like orifice of the prostatic utricles is found at the apex of the veru. To either side of the utricles two small openings of ejaculatory duct may be found. The ejaculatory ducts are formed at the junction of the vas defrans and seminal vesicles. It runs nearly 2 cm through the prostate in line with the distal prostatic urethra.

Zonal anatomy of the prostate:-

The glandular elements of the prostate have been divided into three zones, distinguished by the location of their ducts in the urethra by their differing pathologies and in some cases by their embryologic origin.

Transition Zone:- The duct arises at the angle dividing the preprostatic urethra and prostatic urethra. It passes beneath the prostatic sphincter to travel on its lateral and posterior sides. It comprises 5% to 10% of the glandular tissue. The transition zone commonly gives rise to BPH. It is estimated that 20% of adenocarcinomas of the prostate originate in this zone.

Central Zone:- At this zone the ducts arise circumferentially around the opening of the ejaculatory ducts. This zone constitutes 25% of the

glandular tissue and only 1% to 5% of adenocacinomas arise at the central zone.

Peripheral Zone:- makes up the bulk of the prostatic glandular tissue (70%) and covers the posterior and lateral aspects of the gland. Its ducts drain in the prostatic sinus along the entire length of the prostatic urethra. Seventy percent of prostatic cancers arise in this zone.

Clinically The prostate is often spoken of as having two lateral lobes, separated by central sulcus palpable on rectal examination and a middle lobe, which may project into the bladder in older men.

Blood supply:- The arterial supply of the prostate arises from the inferior vesicle artery. It divides into two main branches:-

1. Urethral artery which supply the urethra, periurethral glands and the transition zone. Thus in BPH, these arteries provide the principal blood supply of the adenoma. When this gland is resected or enucleated, the most significant bleeding is commonly encountered at the bladder neck particularly at the 4 and 8-o'clock position.

2. The capsular artery is the second main branch and it gives capsular branches. These branches pierce the capsule to supply the glandular tissue.

Venous and lymphatic drainage:-

Venous drainage is abundant through the peri-prostatic plexus. Lymphatic drainage is primarily to the obturator and internal iliac nodes. A small portion may initially pass through the presacral group or less commonly, the external iliac nodes.

Nerve Supply:-

Sympathetic and parasympathetic innervation from the pelvic plexus travels to the prostate through the cavernous nerve[(11)].

PHYSIOLOGY OF THE PROSTATE

The prostate has a sexual function, but it is a little unclear how important its secretions are to human fertility.

Growth of the prostate and hormonal influence:-

The growth of the prostate is governed by many local and systemic hormones.

The main hormone acting on the prostate is testosterone which is secreted by the ledge cells of the testes under the control of anterior pituitary. Testosterone is converted to 5-de-hydrotestosterone (DHT) by the enzyme 5-hydroxy - reductase which is found in high concentration in the prostate and the perigenital skin.

Other locally acting peptides are secreted by the prostatic epithelium and mesenchymal stromal cell in response to steroid hormones. These peptides undoubtedly play part in normal and abnormal prostatic growth, but yet their functions are unclear.

Elaboration and secretion of prostate-specific antigen (PSA) and acid phosphatase:-

PSA is a glycoprotein. Its function may be to facilitate liquefaction of the semen and it is marker for prostatic disease

PSA measurement has superseded measurement of serum acid phosphatase[(12)].

BENIGN PROSTATIC HYPERPLASIA (BPH)

Etiology of BPH:

BPH is a disease of aging males**.** Its Incidence increased with age. Normal androgen hormone status also is etiological risk factor.

The disease is not seen in men below 20 years and castrated males before puberty.

The precise etiology is uncertain. Increase in the number of the cells may be to epithelial and stromal cell proliferation or impaired programmed cell death.

Hormonal factors:-

Androgen, estrogens, growth factors, and some neuropeptides may play a role singly or in combination [13].

The initiation of BPH may not be environmental or genetically influenced. The prevalence of microscopic BPH increases with age in all male population and that all men will develop BPH if they live long enough[3].

Pathology of BPH:-

The earliest change of BPH occurs in the periurethral gland around the verumontanum.

Hyperplasic changes may result in stromal nodules, acinar nodule or mixed fibroadenomatous nodules.

The stromal nodules are composed of varying amounts of fibrous and smooth muscle cells and may be infiltrated by lymphocytes.

Fibromuscular nodules contain varying amounts, of fibrous tissue admixed with glandular hyperplasia.

Glandular hyperplasia may occur as predominantly acinar nodule or mixed with stromal hyperplasia.

The glands are often large with unfolding acini composed of tall columnar cells[3].

Clinical picture:-

Benign prostatic hyperplasia (BPH) occurs in many men around or above the fifth decade of their age. Symptoms known as lower urinary tract symptoms (LUTS) are either obstructive or irritative.

Obstructive symptoms includes:-

- Hesitancy
- Poor stream
- Intermittent stream
- Dribbling
- Sensation of poor bladder emptying
- Episodes of near retention.

Irritative symptoms includes:-

- Increased Frequency
- Nocturia
- Urgency
- Urge incontinence

- Nocturnal incontinence[12]

These symptoms are not specific for BPH. They may occur with some others lower urinary tract disorders. Many scoring systems were developed to assess the severity of LUTS. International prostate symptoms score (I.PSS), which was developed by the American Urological Association (AUA). In patients with BPH this scoring system is used to help in selection of suitable type of treatment[4,14,15]. However some symptoms may not reflect the underlying problem accurately.

BPH can give rise to haematuria; in this case other causes of haematuria should be excluded[12].

Rectal examination:-

Digital rectal examination DRE provides sufficiently accurate estimations of the sizes and feeling of the prostate in most cases. However the size of the prostate should not be the only decisive factor in considering whether active treatment is required. Prostate size does not correlate with symptoms severity, degree of urodynamic obstruction or treatment outcome[13].

Investigations: -

There are some important investigations for patients with enlarged prostate. These investigations are to confirm the diagnosis and assess the degree of urinary obstruction, complications due to long standing obstruction and to answer important points about the patient's condition which can lead to selection of suitable type of treatment**.** These are:-

1- **Urinalysis:**- to role out the presence of infection and/or haematuria. Haematuria is a cause for a work-up for other conditions.

2- **Blood urea and electrolyte**: - provide baseline information about renal functions.

3- **Ultrasonography:-** In BPH ultrasonography (U/S) is very useful in measuring bladder and prostate volume as well as measuring residual urine. Estimation of bladder and prostate volume with US is in the accuracy range of 80-87%. U/S also detects bladder calculi, diverticula, large bladder tumour and other obvious bladder pathology.

4- **Transrectal ultrasongraphy (TRUS):** It is a useful procedure in estimation of sizes of the prostate and increases the detection rate of ca prostate up to about 60%. TRUS guided biopsy of the prostate is more accurate than digital guidance[3,16,17].

5- **Urethrocystoscopy:-** When need for surgery has been determined, cystoscopy is useful for several reasons:-

1. The position of the ureteral orifices may be noted to prevent inadvertent injury.
2. Assessment of bladder capacity, bladder trabiculations and diverticula.
3. Occasionally, bladder calculi and small bladder tumour not recognized by preoperative U/S evaluation may be noted[3].

6- **Prostate specific antigen (PSA):-** PSA has been in wide-spread clinical use since 1987. Since that time, PSA has been used as a marker to measure recurrence after therapy and more recently as a marker for early detection of the prostate cancer.

The normal level of serum PSA is 4 ng/ml or less.

From 4.1–10 ng/ml is mild elevation but can not role out malignancy

From 10 to 20 ng/ml is suspicious.

If serum PSA More than 20 ng/ml prostatic biopsy should be taken , regardless of the DRE; this can give 65% cancer detection rate.

It is recommended that PSA measurement should be delayed for four to six weeks after TURP, or prostatic biopsy due to the expected elevation of PSA after these procedures[18].

7- **Transrectal biopsy of the prostate:-** The most common indication for prostatic biopsy in a palpable prostatic nodule is to role out the possibility of adenocarcinoma. When suspicious findings detected by digital rectal examination (DRE) or by elevation of PSA (normal value < 4 ng/ml) biopsies are required to exclude carcinoma[19].

8- **Urodynamic:-** Use of urodynamics in the diagnoses of BPH is still controversery[20].

In BPH urodynamics were considered in many studies as one of the tools of preoperative evaluation and post operative follow-up.

Urodynamics based on low flow rate with high voiding pressure flow rate <10 ml/second for void volume more that 200ml, will be sufficient for most urologist to recommend treatment [21, 22, 23].

CARCINOMA OF THE PROSTATE

Etiology:-

Ca prostate also is a disease of ageing men and it rarely occurs in men below 40 years of age. Etiology of ca prostate based upon epidemiological observation, at least four factors has been cited as possibly etiological in prostate cancer. These include genetic predisposition, hormonal influences, dietary and environmental factors and infectious agents[3].

Treatment of ca prostate:-

In early carcinoma of the prostate which is suspected by finding of prostatic nodules in digital rectal examination, the diagnosis has been improved by measuring PSA level, transrectal ultrasound and transrectal biopsy[17,24,25]. Radical prostatectomy gives good chance for cure in early diagnosis.

In advanced cases of prostatic carcinoma with severe obstructive symptoms, acute urine retention and evidence of distant metastasis, TURP may be combined with orchidectomy or other hormonal therapy to prevent further progression of symptoms[3].

TRANSURETHRAL PROSTATECTOMY

History: -

Transurethral prostatectomy was developed in United State in the 1920s and 1930s. Nesbit (1975) pointed out that there were several significant factors important in its development.

The invention of incandescent lamp by Edison in 1879. The cystoscope development independently by Nitze and Lietr in 1887. The development of the fenestrated tube by Hugh Hampton Young which allowed the obstructing tissue to be sheared off blindly. Other important factors: In 1908 invention of the vacuum tube by Deforest that allowed the constant production of high-frequency electric current that could be used in resecting tissue. In 1926 Bumpus combined the cystoscope and the tubular punch. Also at that time, Streans developed the Tungsten loop that could be useful for resection. This was put together by Mccarthy in 1932 using a Forobligue lens so that could resects the tissue under direct vision using a wire loop. In the 1970s the development of fibroptic lighting system, together with the Hopking (1976) rod lens wide angle systems significantly improved visualization for endoscopic surgery.

Over the years, transurethral resection of the prostate TURP, as treatment modality for obstructing benign prostatic hyperplasia BPH, gained popularity throughout the world[5]. It is now considered the golden standard for surgical management of BPH.

Resectoscope:-

A resectoscope sheath with its obturator, size 26 E or 24 E once sheath has passed into the bladder, the obturator is removed and replaced by the working elements of resectoscope, which has a channel for the fore-oblique or direct view telescope (a 0 or 120 or 30 depending upon the make of the instrument) and one for the loop electrode.

Deferent working elements, have different mechanism for moving the loop backwards and forwards, but most are now one handed. Cutting loops vary in size and are colour coded.

The larger the loop, the larger the chips of prostate that can be cut, but the surgeon should select the suitable size of the loop which can pass easily without damaging the urethra.

The loop consists of cutting wire, supported on an insulated stem by an insulated fork, which often incorporates a stabilizing device. The proximal end of the loop fit into insulated block of the

working elements, which attached to diathermy machine by the diathermy cable. The tap on the resectoscope sheath is connected to the source of the irrigating fluid, which is usually in plastic containers.

Irrigation and irrigants:-

The working element has to be removed from the sheath at regular intervals to empty the bladder. Cystoscope with continuous irrigation is available now. The irrigant fluid should be isotonic or near isotonic. The available one is glycine 1.5%. Sterile normal saline should not be used during the resection because it is electroconductive and may disturb the electrocuting coagulation current[26]. Relative safety of distilled water as an irrigation fluid for TURP under continues drainage has been reported by some authors[27.28].

Indications for TURP:-

In BPH the most common reason that intervention is recommended in a patient with symptoms of bladder outlet obstruction and irritability, that the symptoms are moderate to severe, bothersome and interfere with the patient's quality of life[5].

The American Urologist Association (AUA) in a recent survey of 4000 cases found that the most common indication for transurethral prostatectomy include symptoms of prostatism in 90% of the patients, prostatism with residual urine in 15%, prostatism with acute urine retention 9.6% and combination of all three is 5.6%. Other operative indications reported were recurrent UTI in 12%, haematuria in 12%, renal insufficiency in 4.5% and bladder stone in 3%[3].

Preoperative preparation for TURP:-

All those patients above forty years so apart of urological work-up, complete blood count, chest x-ray, ECG, blood urea, electrolyte and creatinine, urine for sugar and acetone are required. On admission a formal signed consent should be obtained, blood grouping with preparation of two units of blood and good preoperative anaesthetic assessment should be done. Patients must be fasting six hours before the procedure[3,29].

Anaesthesia :-

Transurethral surgery of prostate is usually performed under general, spinal or epidural anaesthesia[30]. Regional versus general anaesthesia has been evaluated. The results revealed that no deference in blood loss and postoperative morbidity or mortality[31].

Preoperative Antibiotic: -

Urinary tract infection can be found in 8% to 24% of BPH patients preoperatively. The infection should be treated prior to surgery.

The use of prophylactic antibiotics in TURP is somewhat controversial. It is recommended that the patients should be given systemic antibiotic prior to initiation of surgery and then maintain the patients on oral antibiotic for five days after catheter removal[5].

SURGICAL TECHNIQUE OF TRANSURETHRAL RESECTION OF THE PROSTATE (TURP)

TURP should be done in a theatre, where transurethral or open prostatectomy can be done, with preparation of two units of blood which would have rarely been used.

Position on table: -

Patient placed in the appropriate position for cystoscopy. Avoid excessive flexion of hip and knees and make sure that the legs rest, but no strain on hip and knees. Clean the skin of the penis and scrotum with sterile betadine and put on sterile drapes. The penis

brought through a hole in the center of the sheet. Below this hole is a finger cot which is lubricated and inserted into the rectum. This will help the surgeon to examine the prostate through the rectum without becoming unsterile.

Cystourethroscopy :-

After filling the urethra with lubricant then start with calibration of the urethra, then with cystourethroscope, look for any abnormality like urethral stricture which my need internal urethrotomy (DVIU). Look for blabber tumour, stone, or diverticula and then look for ureteral orifices, trigone and bladder neck. Then determine the land marks, neck of bladder, verumontanum and the external sphincter muscle.

Assessment of prostates size:-

The assessment of prostates size is made partly by endoscopy and partly by bimanual examination, which is best done while the cystoscope is in the bladder[(26)].

Technique:-

Various techniques have been suggested for systematic removal of the adenomatous tissue. They all are based on the principle that the resection should be done step by step, i.e:-

The Nestbit surgical technique has three stages.

First stage:- The fibers at the bladder neck and those of the immediately adjacent prostatic adenoma are resected with short, full-thickness bites circumferentially around the bladder neck. This process starts at the 12 o'clock position and then carried out on either side until finally the bladder neck tissue between 5 and 7 o'clock is resected in this manner.

The second stage:- The adenoma resected in quadrants. The resectoscope is placed in front of the veru and the resection started at 12 O'clock position. The upper quadrants on both right and left side are resected first down to the fibers of the surgical capsule, then the lower quadrants resected down to the surgical capsule.

Surgical capsule can be identified by a number of hall marks. For example, the yellowish, nodular tissue of adenoma changes to the white glistening surface of the compressed peripheral zone of the prostate or surgical capsule.

At the third stage:- The adenomatous tissue surrounding the verumontanum is resected last. After completing the resection of all adenomatous tissues down to the surgical capsule circumferentially, an incision of the bladder neck my be performed as recommended by

Kulb et al to prevent bladder neck contracture specially in a patient with a small prostate.

The introduction of constant-flow resectoscope facilitate the procedure by allowing continuous resection, clear vision and low pressure within the prostatic fossa, with decreased fluid absorption and shortened surgical time.

During the operation, the accumulation of the chips of the prostate and blood clot, which makes unclear vision, should be removed with Elik evacuator. Haemostasis should be achieved perfectly throughout the procedure and after completion of the resection, particularly around the bladder neck where small bleeders are often seen[30].

Some important points must be considered during the procedure:-

1. Do not resect below the verumontanum or above bladder neck.
2. Hold the resectoscope sheath still while resecting to be sure, only the loop moves and cutting done under vision.
3. Achieve haemostasis after each cut or at least before digging another trench.

4. Do not cut unless you can see clearly; abandon the procedure if you can not[26].

A 24 Fr, three-way Foley catheter inserted. It is not recommended to inflate the balloon in prostatic fossa. The balloon inflated with approximately 30 ml of suitable fluid. Continuous or intermittent irrigation started. Irrigation is stopped once the washing fluid is clear. On the first or second postoperative day catheter may be removed (24-48 hours)[26,30].

COMPLICATIONS OF TURP.

Complications of TURP can occur intraopertively, immediate postoperative or as late outcome. These include:-

1. Perforation:-

Perforation of the prostatic capsule or bladder can occur interaoperative. This may be as a result of inexperience in association with a large prostate or heavy blood loss. If the vision obscured due to heavy bleeding, better to achieve good haemostasis abandon the procedure and insert a urethral catheter. Suprapubic

space drainage may be needed. If any suspicion of intraperitoneal extravasation, the peritoneum should be opened[12,26].

2. Bleeding:-

Bleeding is a major risk following prostatectomy some times requires blood transfusion. In TURP care should be taken, bleeders must accurately stop with diathermy. Patients should be warned about secondary bleeding that may occur after discharge. If patient came back with clot retention, reinsert catherter wash the bladder , and observe the patient for bleeding. To refer the patient to theatre is rarely needed[12].

3. Transurethral Resection syndrome (TUR syndrome):-

This complication can result from entrance of irrigant fluid to the vascular compartment. Type of irrigant should be isotonic or near isotonic (glycine 1.5%). Risk of TUR syndrome increase with prolonged resection time (more than 90 minutes), large prostate and perforation of prostatic capsule or bladder.

The syndrome is characterized by increase of intravascular fluid, which may lead to hypervolaemia, hyponatraemia haemolysis. nausea, vomiting, hypertension, bradycardia, visual disturbance,

convulsions and coma may occur. Usually symptoms do not appear until serum sodium reaches (125 mEq).

Treatment should start promptly with close monitoring for vital signs cardiac status and urine output. Serum electrolyte must be followed closely. Hypervolaemia and hyponatraemia should be corrected by giving the patients 200 ml of 3% saline very slowly over a period of time and diuretic (furosemide)

The American Urologist Association (AUA), in a cooperative study, found that TUR syndrome occurred in 2% of patients who underwent TURP [5].

4. Clot retention:-

This is one of the serious immediate complications of any type of prostatectomy and occur when blood colt block the catheter. It rarely occur while the bladder is irrigated through a three ways catheter. Milking the catheter or using bladder syringe can clear small clots. If these measures are unsuccessful, the patient should be taken to the theater and a large bore catheter or resectoscope sheath passed through urethra under general anesthesia to allow evacuation of the clot by vigorous irrigation with Wardill's all- glass or

Elik evacuator . If even this failed, the bladder must be opened or reopened, although that is rarely necessary .

5. Urine incontinence:-

Some patients have stress or urge incontinence for some days after operation. Incontinence is uncommon unless the external sphincter has been damaged and this should not happen. By taking care, resection should not extent beyond verumontanum. In some patient incontinence occur due to some residual apical tissue, continence may restore with resection of this tissue[26].

6. Infection:-

Bactraemia may occur after TURP. Antibiotics as prophylaxis with induction of anesthesia and for few days after the procedure, reduce the incidence of bactreamia. Postoperative urinary tract infection may occur if the catheter remains more than one week. If the catheter remained for a long time, culture may be needed after removal of the catheter to treat the residual infection. Epididymitis is so rare after TURP[10]

7. Urethral stricture:

It may be due to prolonged catheterization, unnecessarily big catheters and/or clumsy instrumentation. It can occur just inside the

meatus or in the bulbar urethra. Early stricture can be managed with simple bouginage, but later on, it may need urethrotomy.

8. Bladder neck contracture:-

Occasionally occur as a dense fibrotic stenosis of bladder neck as a result of over aggressive resection of small prostate, or diathermy overuse. Transurethral incision of the scar tissue is necessary [12].

9. Retrograde ejaculation:-

This complication is less common with TURP than other form of prostatectomy. This possibility should be explained to the patient.

10. Impotence:-

The relation of this complication to TURP is unclear but it may be element of depression. The surgeon should discuss the matter with the patient[10].

ASSOCIATION OF BPH AND PROSTATIC CANCER

There are a number of similarities between BPH and prostatic cancer:-

- Both increase in prevalence with age.
- Both require androgens for growth and development.
- Both respond to androgens deprivation treatment.

Most cancer arises in prostate with concomitant BPH and cancer of the prostate is found incidentally in a significant number (10%) of TURP specimen. Inspite of that, BPH is not a premalignant lesion nor a precursor[32].

HOSPITAL STAY AND CATHETER REMOVAL

Early catheter removal reduces hospital stay. Removal of the catheter within 24 hours, and discharge in 24 to 48 hours after TURP is reasonable and a safe goal for most patients[33].

Alternatively early hospital discharge with catheter in place is a reasonable postoperative management strategy when earlier catheter removal is not appropriate[34].

Chapter Two

OPJECTIVES

1. To determine the indications for TURP in Soba University hospital within the last 5years
2. To find out a criteria for patient selection for TURP in Soba University hospital
3. To assess and evaluate the following:-
    a. preoperative cystoscopic assessment of the prostate gland.
    b. Types of Anesthesia in TURP
    c. Indication of antibiotic use.
    d. Duration of post TURP catheterization.
    e. Hospital Stay following TURP.
4. To identify the value of incidental finding of carcinoma of the prostate.
5. To assess the post TURP complications and their impact on outcome.

MATERIALS AND METHODS

Study design:-

This is a retrospective hospital-based study.

Study area: -

This study was carried out in the Department of Urology at Soba University Hospital.

Study population: -

All the patients who underwent TURP in Soba University Hospital in the period from January 1999 to December 2002 were included.

Exclusion Criteria:-

Patients with incomplete records were excluded from this study.

Data collection:-

One hundred and seven patients who underwent TURP within the last 5 years (January 1999 to December 2003) were studied. The records of one hundred patients were available for this study. Their records (genitourinary cards and files) have been checked and transferred to the questionnaire attached.

Seven patients were excluded because of incomplete records.

Data analysis:-

The data collected was introduced in a computer system and analyzed using the statistical package for social science (SPSS), accordingly tables and diagrams were formed and results obtained. Using manual techniques the frequency of the variables were arranged in tables and diagrams and results were obtained.

Research tools:-

A questionnaire addressing the crucial points was utilized to obtain the necessary information. (The questionnaire is attached at the appendix).

Chapter Three

RESULTS

One hundred male patients, who underwent transurethral resection of the prostate (TURP) in Soba university hospital were included in this study, in the period from January 1999 to December 2003.

In 97 patients (97%) TURP was performed for benign prostatic hyperplasia, while it was performed for Ca prostate in three patients, as relief for obstructive symptoms.

Their ages ranged between 50 and 86 with a mean age of 66.7 years. The majority of the patients 70 (70%) were between 61and 80 years of age, 8 patients (8%) were over 80 years (Fig 1).

The majority of the patients 85 (85%) were from the central parts of the Sudan, 15 patients (15%) from other parts of the Sudan. (Fig 2)

Thirty two patients (32%) were farmers, and 37 (37%) were retired . (Fig 3)

Ninety nine patients were married (99%). (Fig 4)

Presenting symptoms:-

The duration of the presenting symptoms varied from one week to 20 years, with a mean duration of symptoms of 2.3 years.

The duration of symptoms was more than one year in 60 patients (60%), and less than one year in 40 patients (40%).(Table 1). Ninety eight patients (98%) presented with combination of irritative and obstructive symptoms, while irritative symptoms dominated in the remaining group (Fig 5). Increased Frequency was the most common irritative symptom. It was one of the main presenting symptom in 88 patient (88%), followed by dysuria which was one of the presenting symptoms in 86 patients (86%) (Table 2).

The most common obstructive symptoms was weak stream of urine, it was one of the presenting symptoms in 70 patients (71.4%) (Table 3).

Forty patients (40%) presented with urine retention, 19 patients (19%) with haematuria. The least presenting symptom was urine incontinence occurring in 3% of the patients (Fig. 5).

Other associated diseases and past medical history: - Twenty two patients (22%) were hypertensive while 7(7%) were diabetic. Three patients (3%) had renal impairment at presentation.

Four patients (4%) had inguinal hernia, and one patient (1%) had vaginal hydrocele at presentation.

Ten patients (10%) had past history of passage of stone per urethra (table 4).

Thirteen patients gave past history of prostatectomy, 8 (8%) of them were open prostatectomy, and 5 (5%) were TURP.

Two patients (2%) had past history of DVIU (table 5).

Digital rectal examination (DRE):-

The findings of DRE were reported in 84 patients (84%). The size of the prostate was estimated as being less than 40 g in 62 patients (73.8%), between 40-60 g in 10 patients (11.9%), and more than 60gm in 2 patients (Fig 6).The largest size of the prostate estimated was 100g.

The prostate was benign feeling in 81 patients (96.4), malignant in one patient (1.2), and not reported in 2 patients (2.38%) (Table 6).

Investigations:-

The hemoglobin was less than 9gm in 4 patients (4%), and more than 9gm in 96 patients (96%) (Table 7).

The findings of urine analysis were reported in 97 (97%). The urine was found to be infected in 50 patients (51.5%) (Fig 7).

The level of the blood urea was reported in 99 patients (99%). Fifteen (14.85%) were found to had blood urea more than 50 mg/dl (Fig 8).

Ultrasonography:- Abdominal U/S was performed in 70 patients (70%) (Fig 9). In 42 patients (60%), the prostate was reported to have mild enlargement, moderate in 16 patients (22.9) and huge enlargement in 3 patients (4.3%) (Table 8).

Preoperative urethrocystoscopy:- Urethrocystoscopy was performed in 62 (62%). It showed mild enlargement of the prostate in 47 patients (75.8%), moderate enlargement in 9 patients (14.5%), while huge enlargement in 5 patients (8.1%) (Fig 10).

The median lobe of the prostate was the main component of enlargement in 30 patients (48.3%), the lateral lobe in 6 patients (9.6%), while there was trilobar enlargement in 13 patients (20.9%), and it was not specified in 13 patients (20.9%) (Table 9).

Urinary bladder findings at cyctoscopy:- The most common finding was trabiculations, occurring in 26 patients (41.9%). Bladder stones were found in 11 patients (17.7%) (Table 10).

Prostate specific antigen (PSA):- PSA was performed in for 40 patients (40%). In twenty one patients (52.5%) the PSA level was

below 4 ng/L, in 10 patients (25%) it was between 4 and 10 ng/L, in 7 patients (17.5%) between 10 to 20, while in 2 patients (5%) it was more than 20 ng/L (Fig 11).

Transrectal biopsy:- Was done for 11 patients (11%) (Fig 12). In three patients it showed carcinoma of the prostate (27.3%), while in 8 it showed BPH (Fig 13).

Indications of TURP:-

The most common indications for TURP were lower urinary tract symptoms (LUTS). One hundred patients (100%) presented with irritative symptoms, while 98 presented with obstructive symptoms (98%) (Fig 5).

TURP was indicated for LUTS alone in 37 patients (37%), while in 63 (63%) there were combinations of LUTS with other indications (Fig 14).

The most common indications in combination with LUTS were urine retention in 40 patients (40%), haematuria in 19 patients (19%) recurrent UTI in 13 patients (13%), and bladder stone in 11 patients (11%) (Table 11).

Types of Anesthesia for TURP:-

The commonest type of anaesthesia was spinal given in 83 patients (83%), epidural in 9 patients (9%) while general in 8 patients (8%) (Table 12).

There were no complications reported from anesthesia. Prophylactic antibiotics in form of gentamycin or cephalexin were given for all patients with induction of the anesthesia.

The Procedure for TURP:-

All the TURPs were performed using resectoscope size 24F-($STor_2$). The urethra was calibrated as routine up to size 26F; the TURP was performed using distilled water with continuous irrigation in most of the patients.

A size 20 or 22 F 3 ways Foley catheter was left indwelling for 2 to 4 days with irrigation in the first few hours of post-TURP period.

Associated peroperative procedures:-

Additional peroperative procedures were performed in 20 patients (20%); the most common was cystolitholapaxy in 9 patients (39.13%) and urethral dilatation in 6 patients (Table 13).

Mortality:-

There were no intraoperative or postoperative deaths reported due to TURP within the period of the study.

Complications:-

Five patients (5%) developed intraoperative bleeding, 3 of them required a blood transfusion (3%) (Fig 15).

Early postoperative complications:

The total number of early postoperative complications was13 (13%). The most common early post operative complication was UTI, seen in 5 patients (5%), followed by urine retention in 3 patients (3%), then incontinence in 2 patients (2%) while TUR syndrome occurred in only 1 patient (1%) (Table 14).

Late complications:-

Late complications were detected in patients who came for follow-up at least 6 weeks postoperatively.

Sixty two patients (62%) could be followed-up in arrange of 6 weeks to 3.5 years. Out of these 62 patients, 8 (12.9%) presented with irritative symptoms. Urethral stricture occurred in 4 patients

(6.45%), recurrence of obstructive symptoms in 4 patients (6.45%) and haematuria in 4 patients (6.45%). The total number of patients who developed late postoperative complications was 21 patients (33.9%). Fifteen out of these 21 patients showed improvement during the period of the follow-up (Table 15).

Hospital stay and duration of catheterization:-

The mean postoperative duration of catheterization was (3.3) days. In 59 patients (59%) the catheter was removed within the first two postoperative days. In 34 patients (34%) it was removed between 3 to 5 days, while in 7 (7%) patients the catheter was removed after the 5^{th} day. In all patients with prolonged period of catheterization the hospital stay was also prolonged (Table 16).

The mean hospital stay was 5.7 days. Twenty four patients (24%) were discharged within the first 3 postoperative days. Fifty six (56%) were discharged between 4 to 6 days, while in twenty patients (20%) the hospital stay was more than six days (Table 17).

The histopathological findings:-

Figure sixteen shows the result of histopathology in 78 patients representing (78%) of the total sample. In eight patients (10.3%)

the histology showed carcinoma of the prostate, while in seventy patients (89.7%) it showed benign prostatic hyperplasia (Fig 16).

Incidental finding of ca prostate was reported in five patients (7%).

Treatment of post TURP complications:-

Four patients (4%) required blood transfusion and 6 patients (6%) required antibiotic therapy, one of them for bactreamia and the other five for UTI. One patient (1%) who developed TUR syndrome admitted to ICU and treated conservatively. Two patients with clot retention, has clot evacuation using Elik. Four patients with post TURP urethral stricture required DVIU.

One patient with urine retention due to residual prostatic tissue required revision of TURP.

Table 1: Duration of symptoms

	Number	Percent
Less than one month	7	7.0
moth to one year One	33	33.0
More than one year	60	60.0
Total	100	100.0

Table 2: Frequency of Irritative symptoms in 100 patients

	Number	Percent
Increased Frequency	88	88.0
Dysuria	86	86.0
Urgency	63	63.0
Urge incontinence	31	31.0

Table 3: Frequency of Obstructive symptoms in 98 patients

	Number	Percent
Weak stream	70	71.4
Dribbling	57	58.1
Hesitancy	55	56.1
Intermittency	12	12.2

Table 4: past history and associated diseases in 100 patients

	Number	Percent
Hypertension	22	22.0
Belharziasis	17	17.0
passage of stones per urethra	10	10.0
Diabetes mellitus	7	7.0
Inguinal hernia	4	4
renal impairment	3	3.0
STD	2	2.0
Hydrocele	1	1.0
Varicocele	1	1.0

Table 5: past history of surgical procedures in 100 patients

	Number	Percent
prostatectomy (open)	8	8.0
prostatectomy (TURP)	5	5.0
DVIU	2	2.0
Nephrectomy	1	1.0
Pyelolithotomy	1	1.0

Table 6: feeling of the prostate on DRE (digital rectal examination) in 84 patients

	Number	Percent
Benign	81	96.4
Malignant	1	1.2
Not reported	2	2.4
Total	84	100.0

Table 7: Hemoglobin level

	Number	Percent
<9 gm	4	4.0
9-12 gm	47	47.0
>12 gm	49	49.0
Total	100	100.0

Table 8: Prostate size on abdominal U/S in 70 patients

	Number	Percent
mild enlargement	42	60.0
moderate enlargement	16	22.9
huge enlargement	3	4.3
not reported	5	7.1
Normal	4	5.7
Total	70	100.0

Table 9: Lobes affected on preoperative cystoscopy in 62 patients

	Number	Percent
Median	30	48.38
Lateral	6	9.68
Both	13	20.97
not reported	13	20.97
Total	62	100.0

Table 10: Urinary bladder findings at cystoscopy in 62 patients

	Number	Percent
Normal	29	46.8
Trabiculations	26	41.9
Saculations	6	9.7
Diverticulation	9	14.5
vesical stone	11	17.7

Table 11: frequency of other indications in combination with LUTS in 100 patients

Indications	number	percent
Urine retention	40	40%
Haematuria	19	19%
recurrent UTI	13	13%
Bladder stone	11	11%
Renal impairment	3	3%
Adenocarcinoma	3	3%

Table 12: Type of anesthesia

	Number	Percent
Spinal	83	83.0
Epidural	9	9.0
General	8	8.0
Total	100	100.0

Table 13: Associated peroperative procedures done in 20 patients

	Number	Percent
Urethral dilatation	6	26.1
DVIU	4	17.4
Cystolitholapaxy	9	39.1
BNI	2	8.7
TURBT	1	4.4
vesicolithotomy	1	4.4

Table 14: early postoperative complications in 100 patients

	Number	Percent
bleeding (required transfusion)	1	1.0
TUR syndrome	1	1.0
urine incontenence	2	2.0
urine retention	3	3.0
Infection	6	6.0

Table 15: Late Postoperative complications in 62 patients

	Number	percent	No. of pts. improved
Irritative symptoms	8	12.9	6
Urethral stricture	4	6.45	4
Recurrent obstructive symptoms	4	6.45	2
Haematuria	4	6.45	2
Pain after micturition	1	1.61	1
Total	21	33.9	15

Table 16: Duration of catheterization

	Number	Percent
Up to 2 days	59	59.0
3-5 days	34	34.0
>5 days	7	7.0
Total	100	100.0
Mean	3.29 days	

Table 17: Hospital stay

	Number	Percent
<4 days	24	24.0
4-6 days	56	56.0
>6 days	20	20.0
Total	100	100.0
Mean	5.75 days	

Figure 1: Age distribution in years

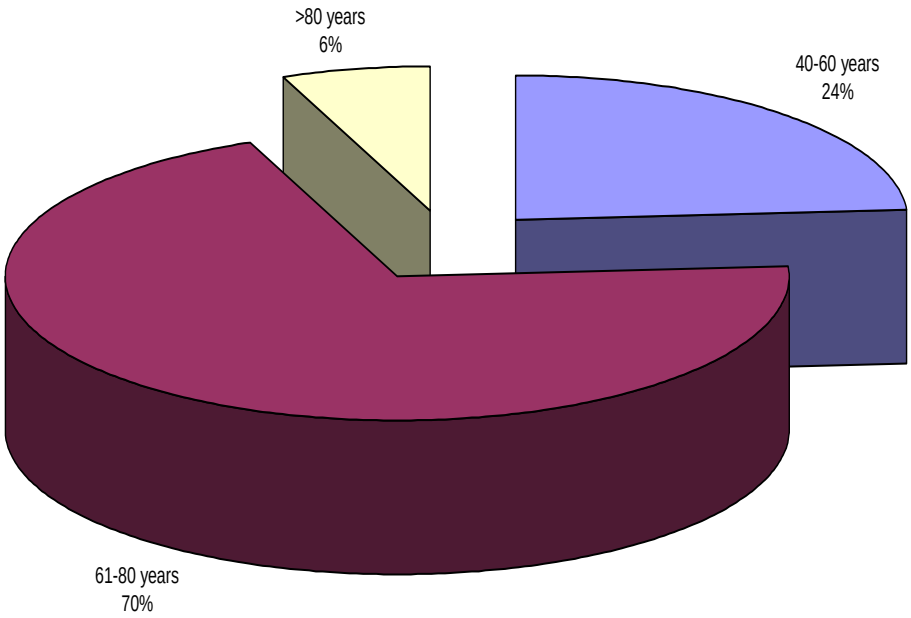


Figure 2: Residence

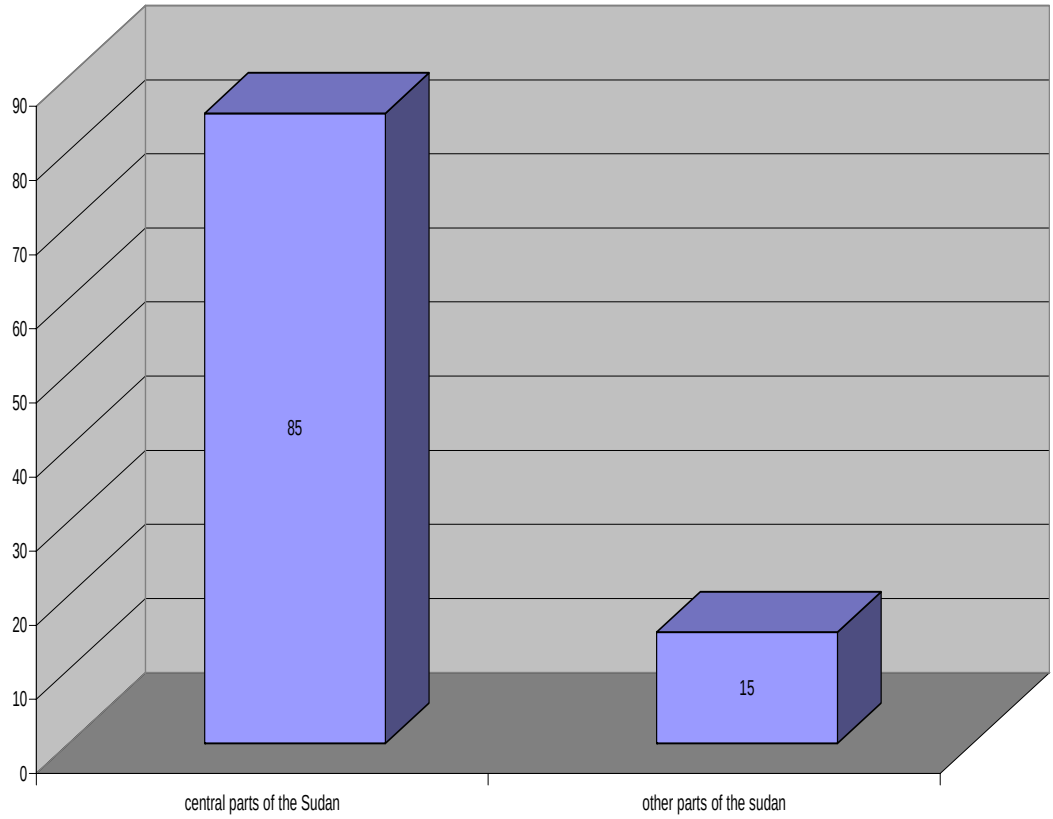


Figure 3: Occupation

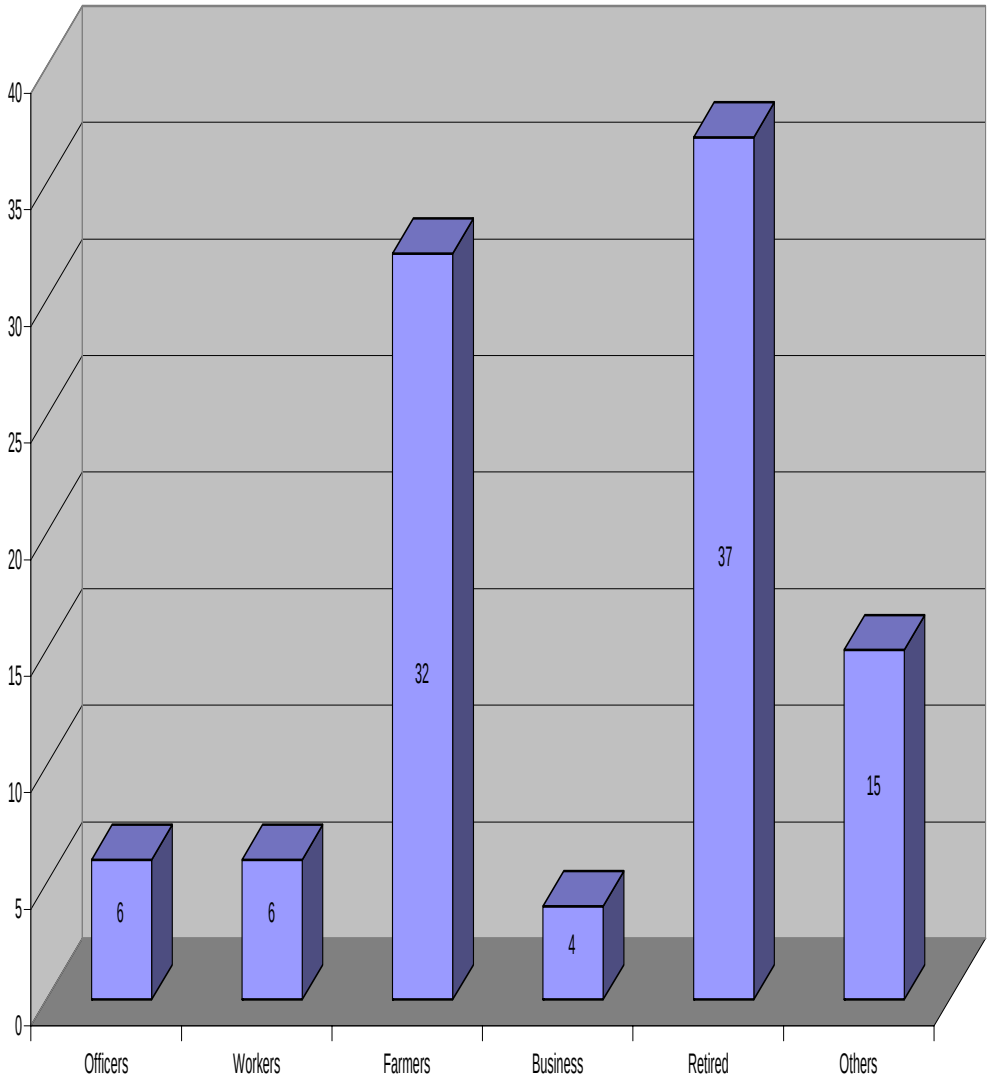


Figure 4: Marital status

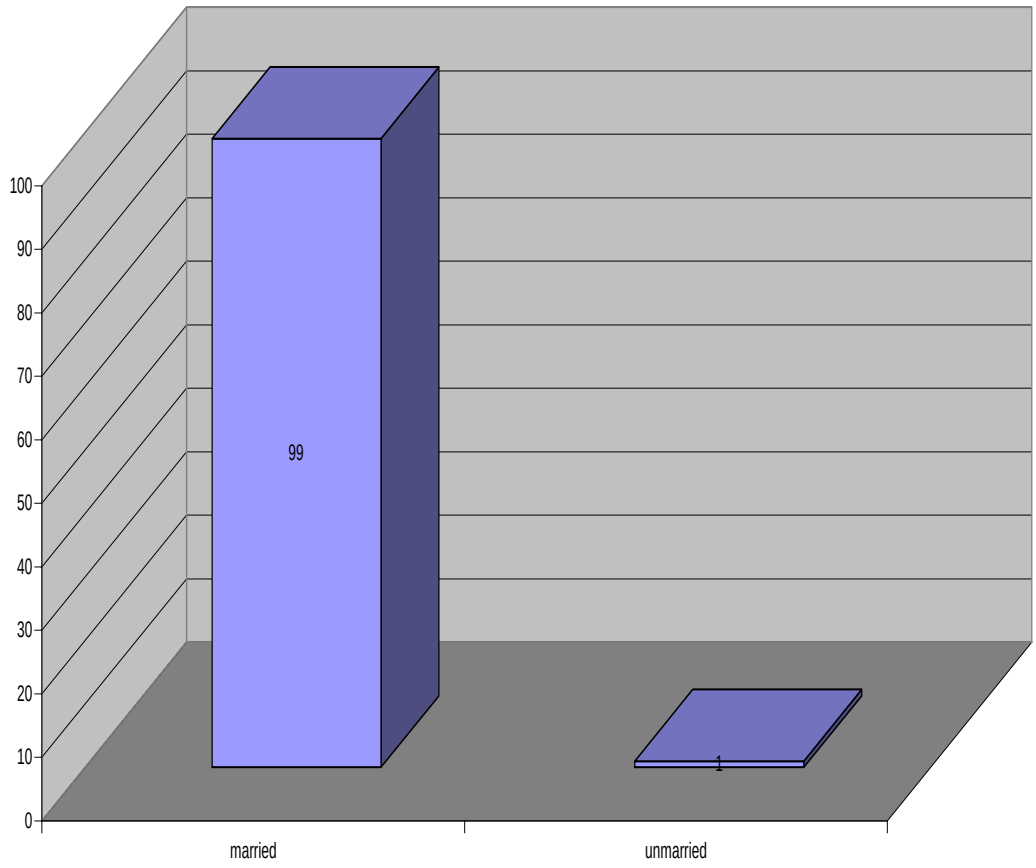


Figure 5: Presenting symptoms(arranged in groups)in 100 patients

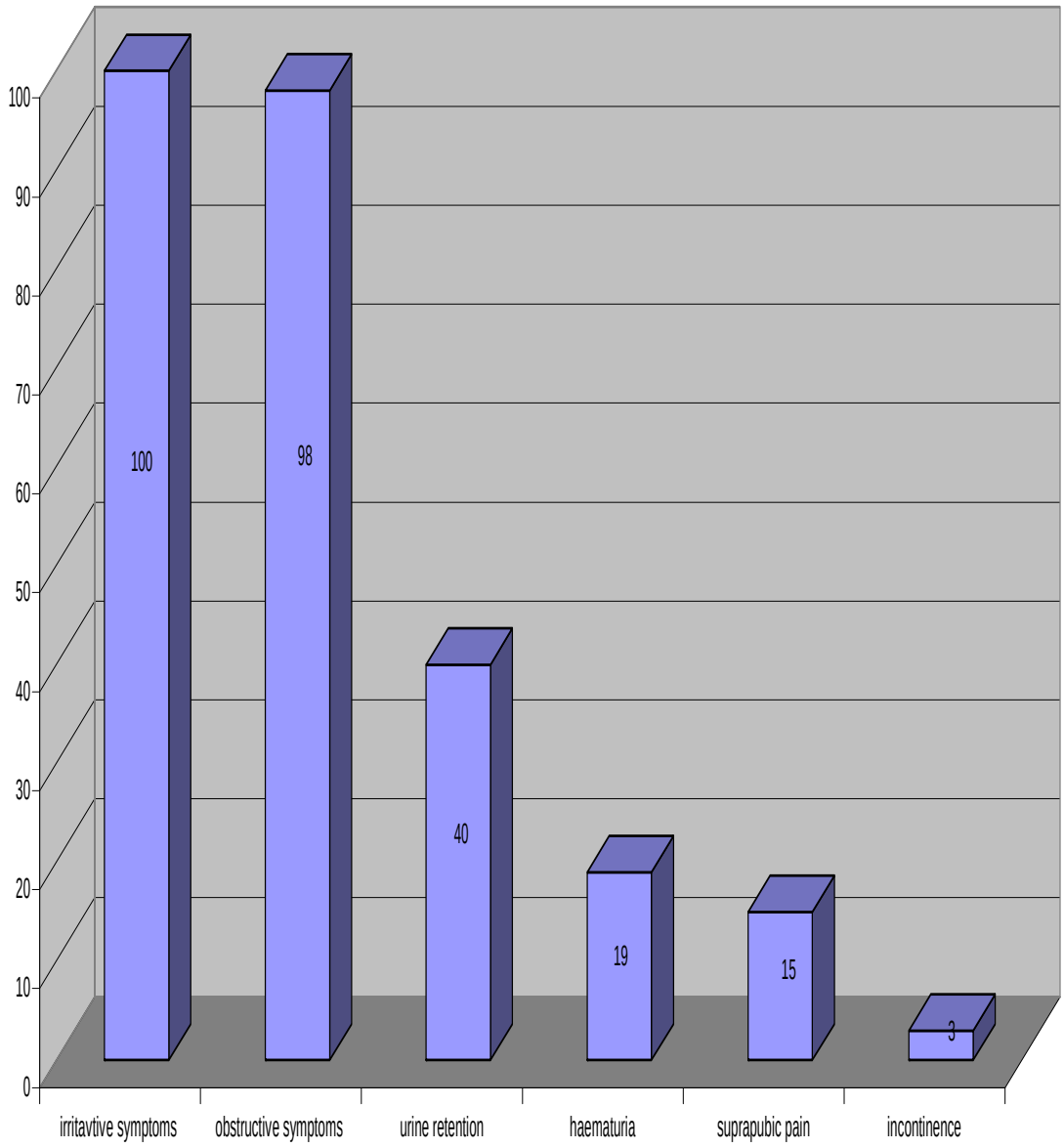


Figure 6: Prostate size on DRE

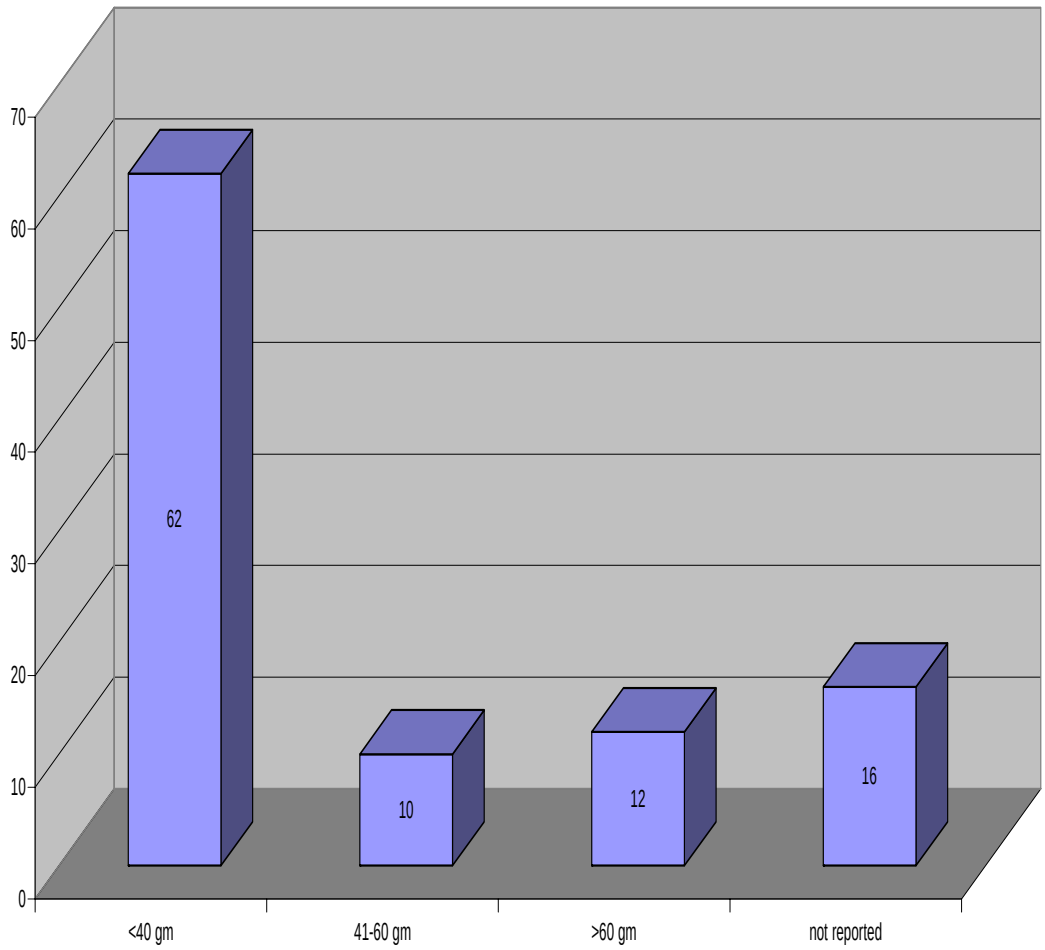


Figure 7: Urine analysis and evidence of infection

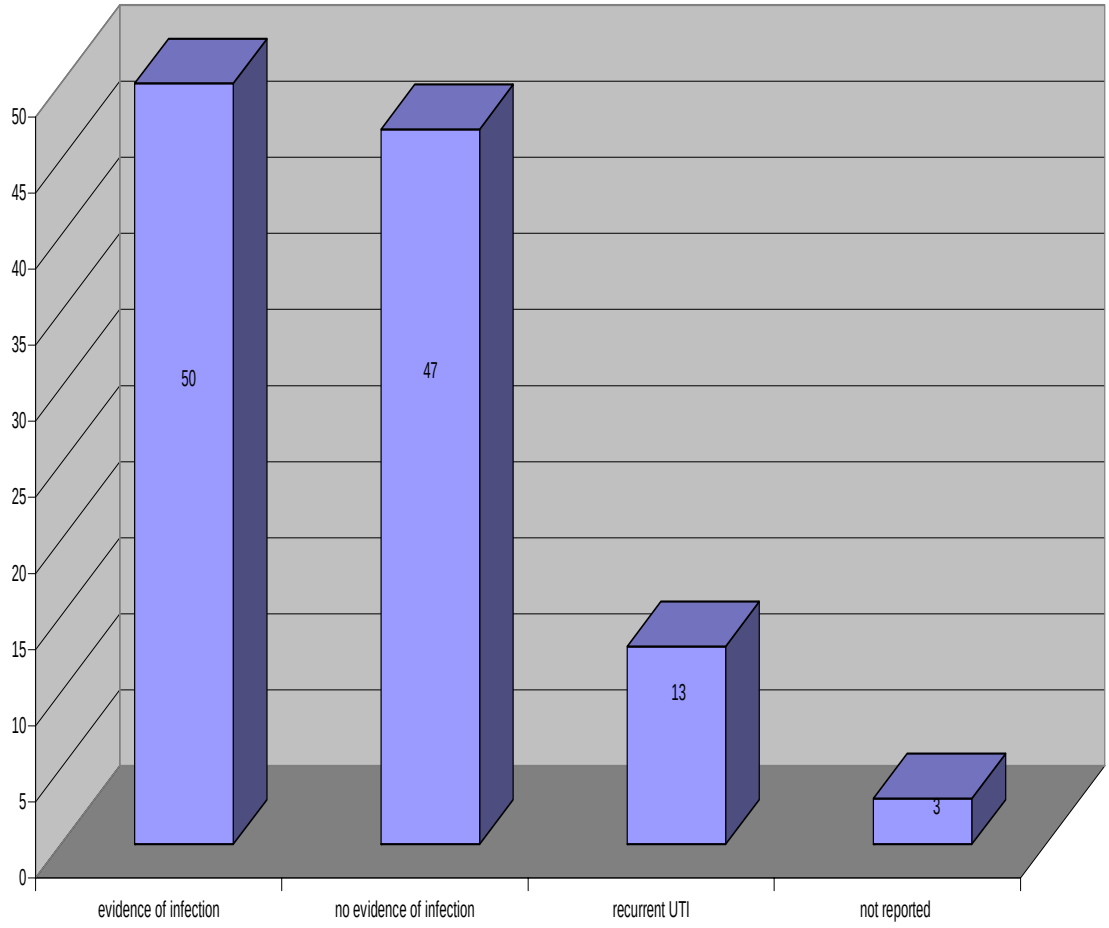


Figure 8: Results of blood urea

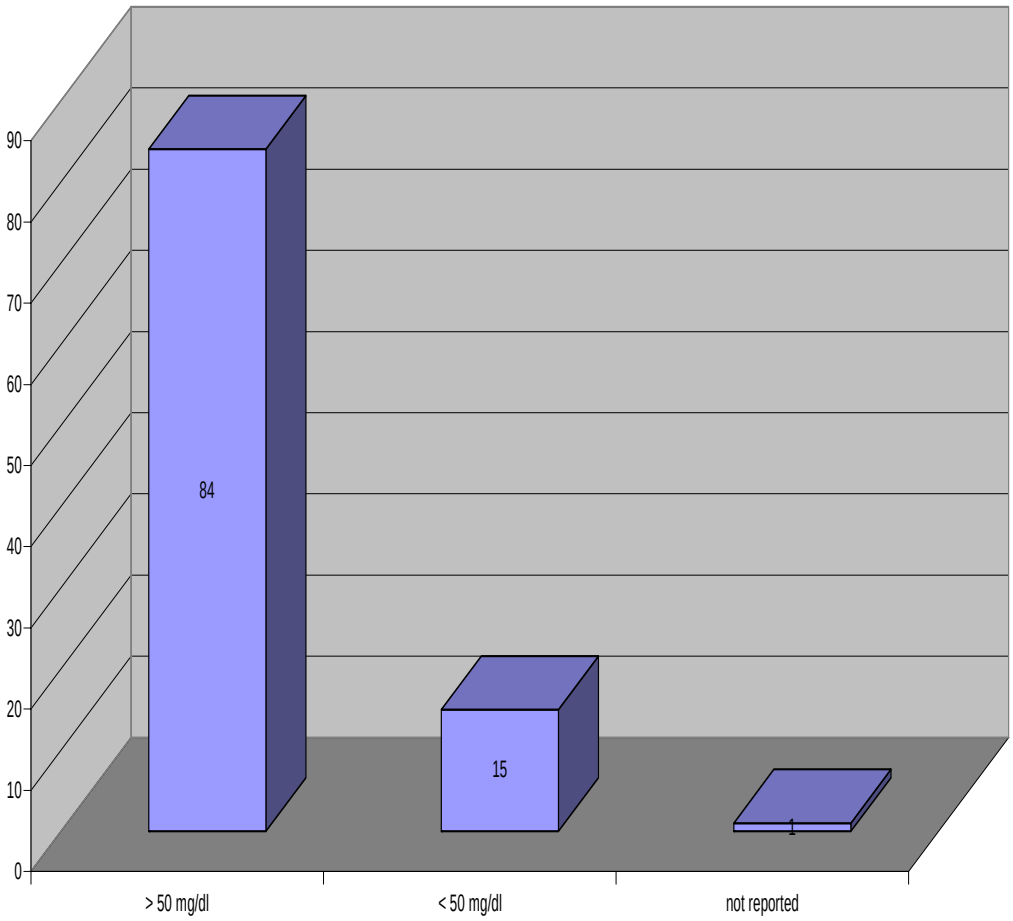


Figure 9: Abdominal ultrasonography

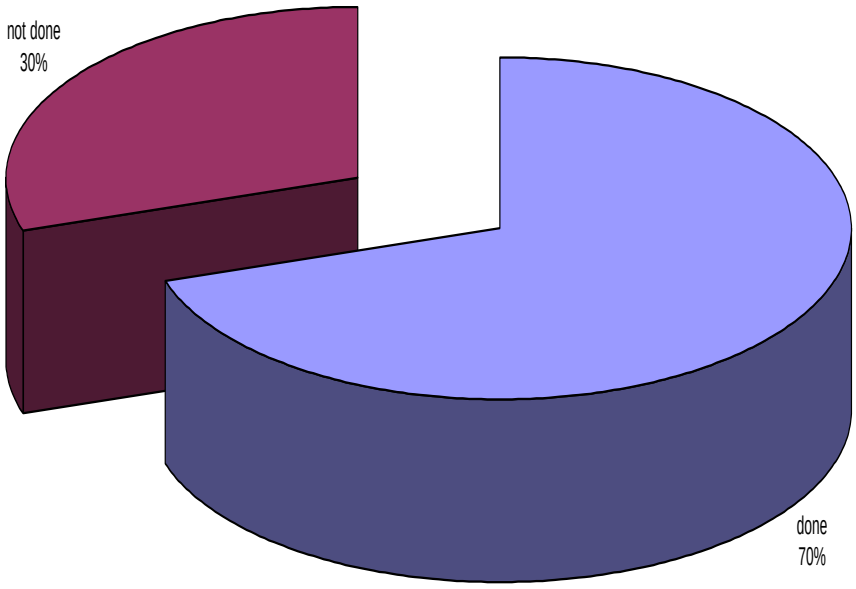


Figure 10: Preoperative diagnostic cystoscopy and description of prostatic size

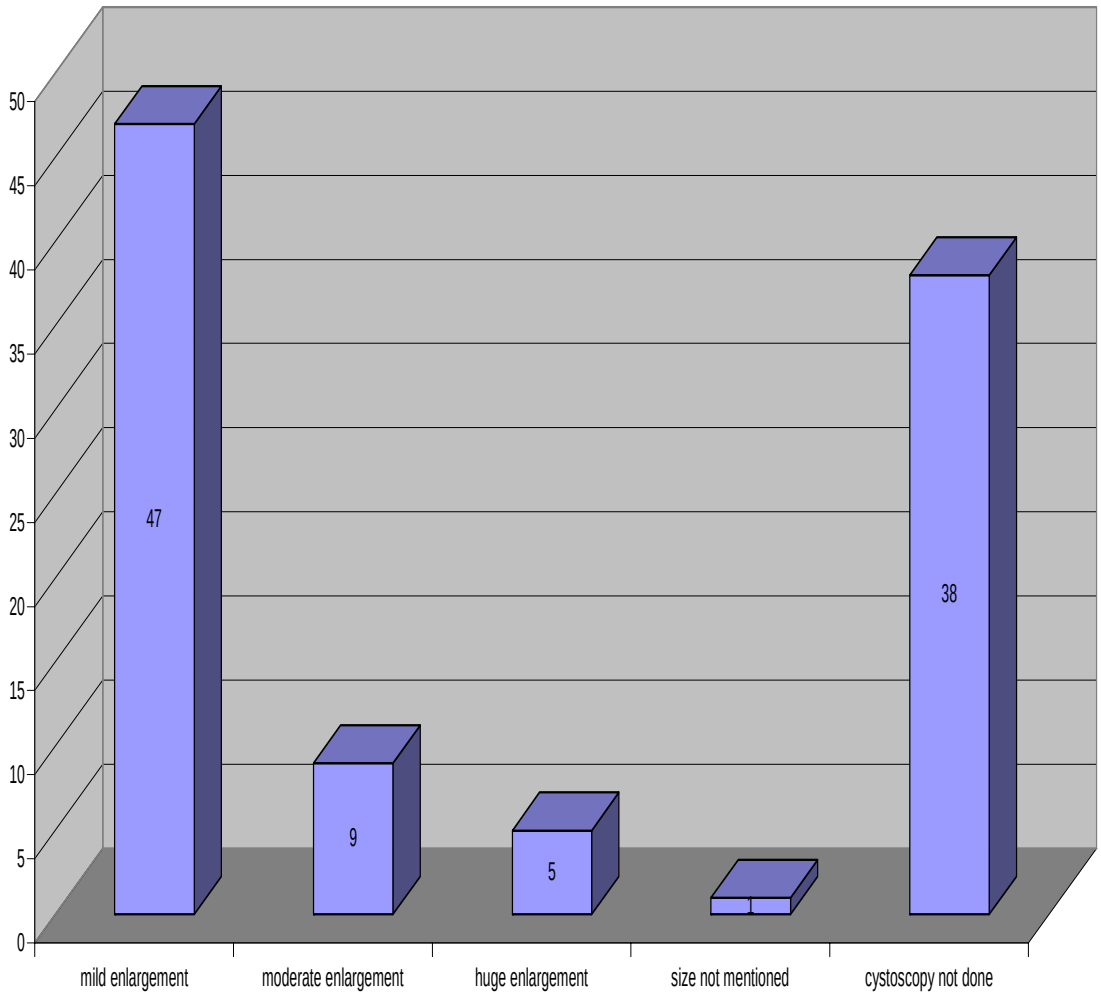


Figure 11: The level of PSA in (40 patients)

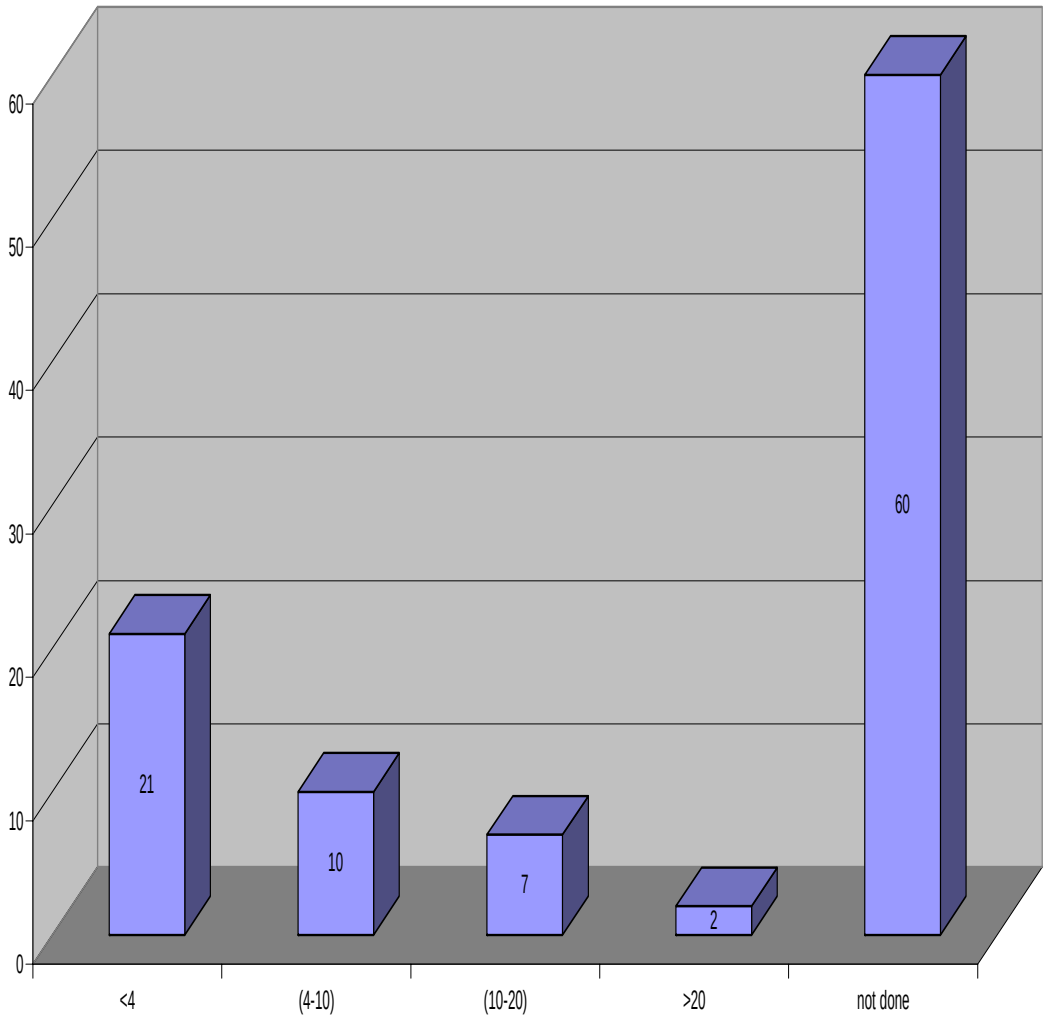


Figure 12: Trans-rectal prostatic biopsy

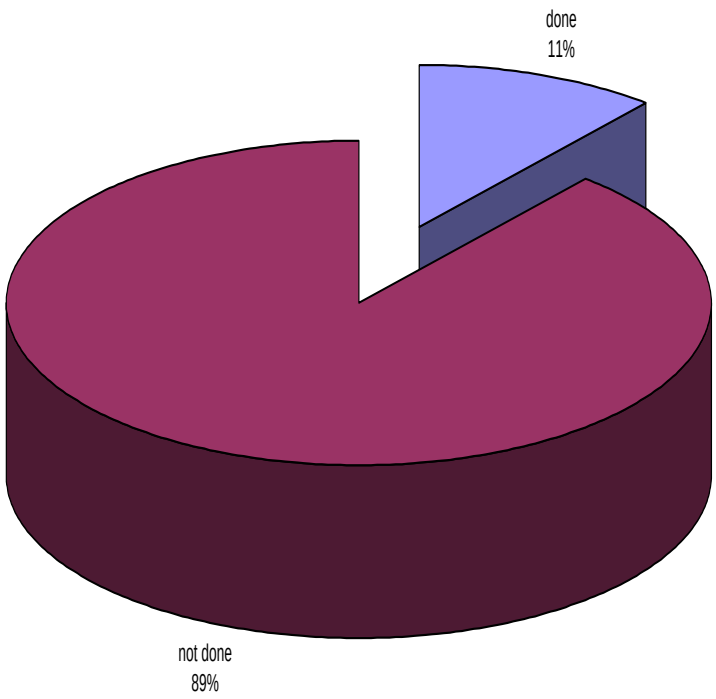
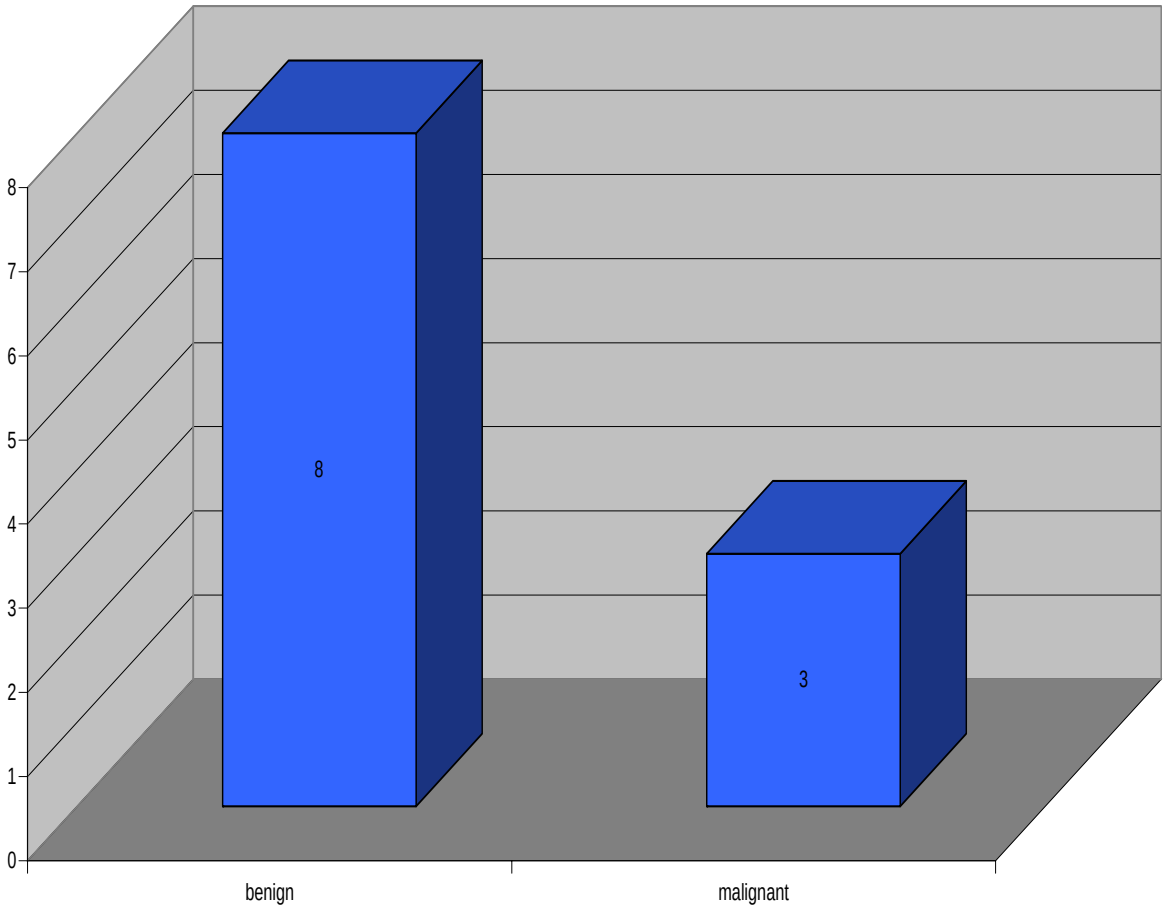


Figure 13:Results of 11 trans-rectal biopsies



Figuer 14: Indications of TURP in 100 patients

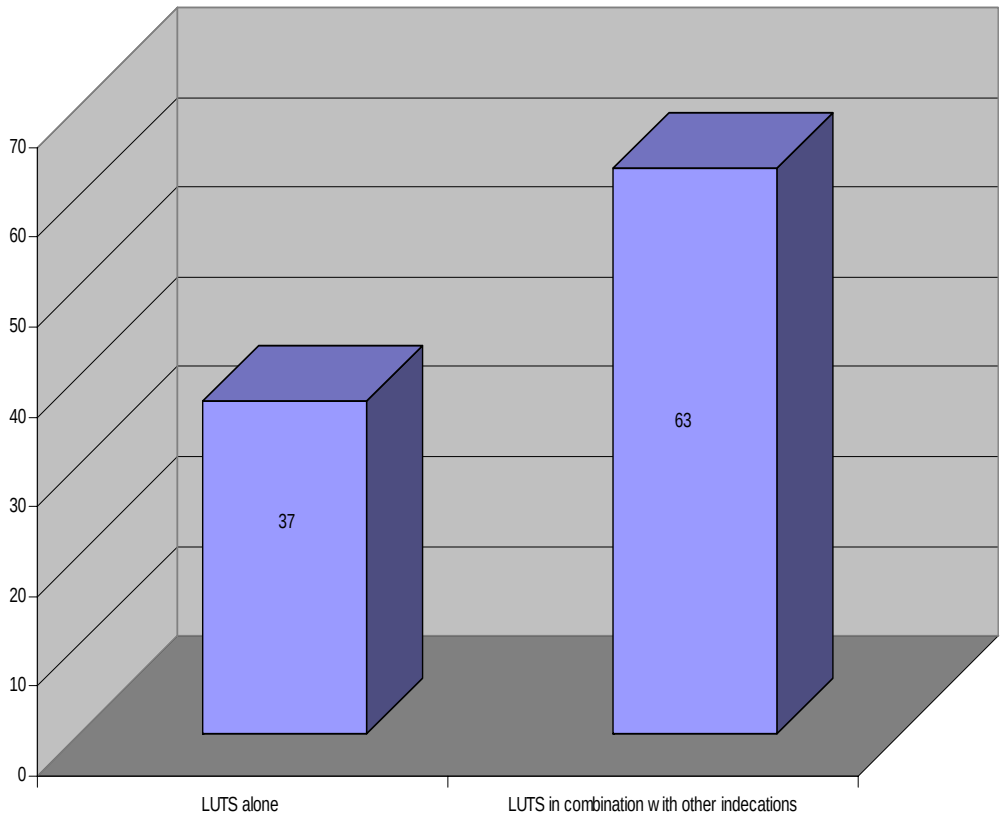


Figure 15: Intraoperative complications in 100 patients

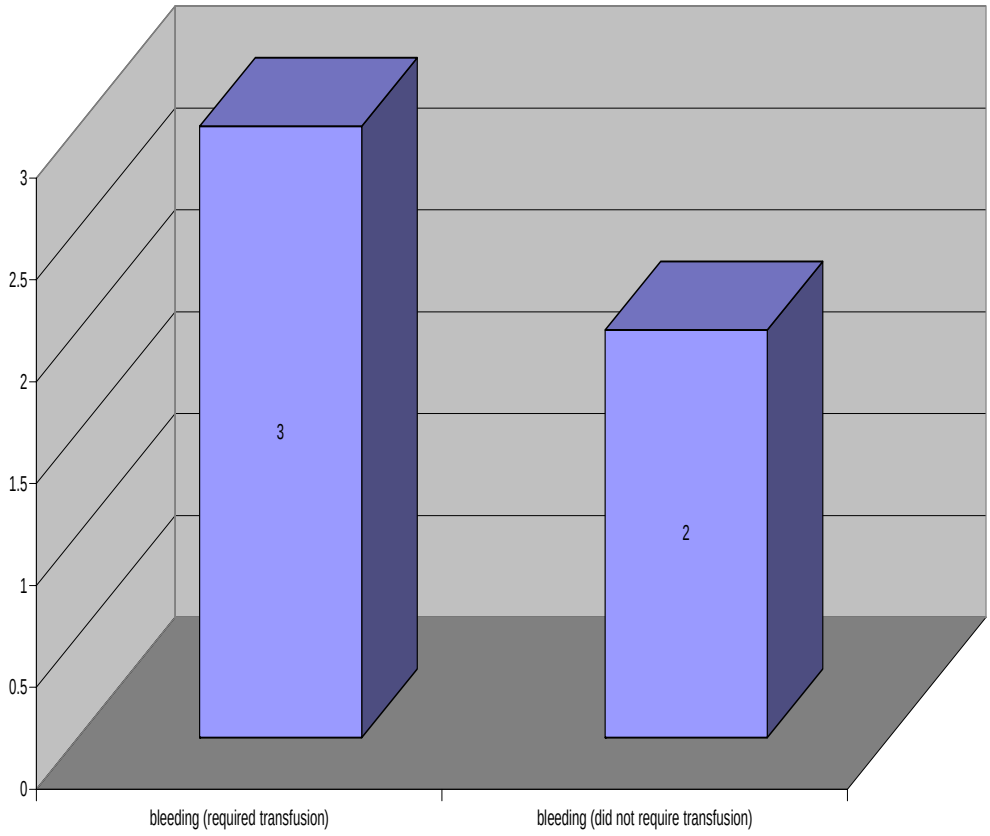
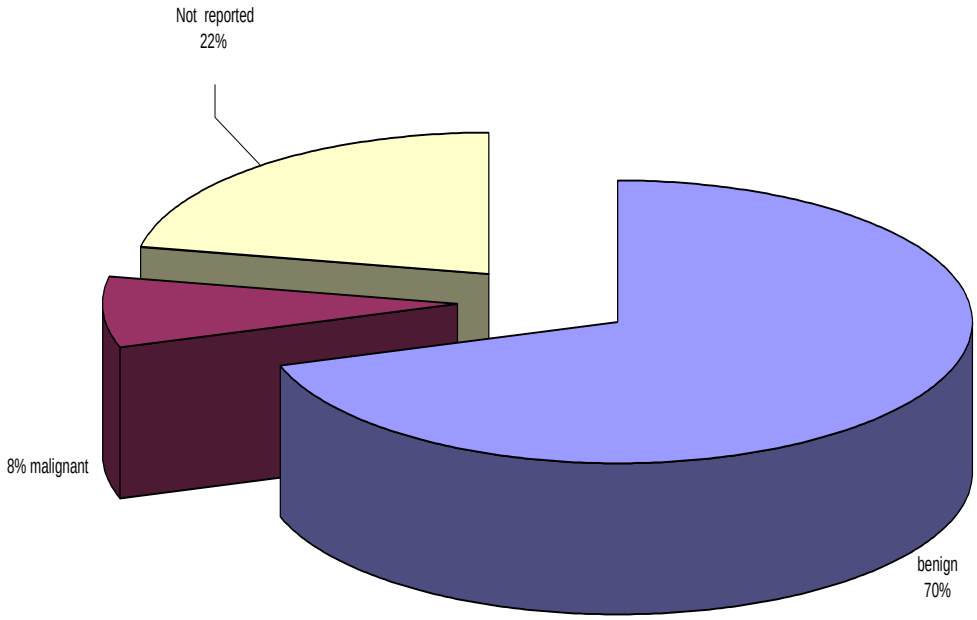


Figure 16 : Histopathology findings



Chapter Four

DISCUSSION

In this study the age distribution was between 50 and 86 with a mean age of 66.7 years. The majority of the patients being in 61-80 age groups. Cetinel et al (1994) in Istambul University evaluated 96 patients with BPH. The mean age was 63.4 years and the most common age was in 60-79 years age group [21].

Mebust et al (1989) in a study including a series of 3885 patients in intraoperative and immediate postoperative complications of TURP. They found that most of the patients being in (60–79) age group[35]. Kambal (1977) in a local study in prostatic obstruction in the Sudan reported a mean age of 66.7 years [36].

The above mentioned findings are consistent with age distribution in the present study.

Most of the patients were from central parts of the Sudan where access to Soba University Hospital is easy and most of the people can afford the cost of the operation.

In this study the duration of symptoms ranged from one week to 20 years with a mean of 2.3 years. This may reflect negligence of

some patients to their symptoms for long periods and ignorance of others to the nature of the disease.

In this study, irritative and obstructive symptoms were dominated while urine retention was the presenting symptoms in 40% of the patients. Kambal (1977) found that more than 80% of his patients presented with urine retention while 17.1% presented with other symptoms[36].

The change in the prevalence of the symptoms may be due to advancement of diagnostic tools which can pick up the problem early, help in the evaluation of the condition and selection of suitable type of treatment. All these can lead to reduction in the complications of BPH. Bruskewitz et al (1986) and Mebust et al (1989) reported that the irritative and obstructive symptoms were predominant while urine retention represent 4% an27% of their patients respectively[22,35]. This is in agreement with the findings of the study.

The review of the medical history in this study revealed that the most common associated medical problem was hypertension. Twenty two percent of the patients were hypertensive while 7% were diabetic and 3% had renal impairment at presentation.

Arther et al (1995) reported hypertension as a common medical problem in 412 patients coming for TURP, cardiopulmonary disease as second while diabetes as third [37].

Mebust et al (1989) in the cooperative study in post TURP complications showed the most common medical problems as pulmonary problems noted in 14.5% of his patients. Hypertension was the principal condition among 43% of unclassified medical problems. Diabetics noted in (9.8%) of the patients and renal insufficiency in (9.8%)[35].

In this study (13%) of the patients had past history of prostatectomy. Eight percent had open and 5% TURP. The time lapsed between the first operation and symptoms recurrence ranged between (6-14) years for open prostatectomy and 8 month to 5 years for TURP. In comparison: Mutest et al (1989) reported similar results in his cooperative study in post TURP complications. He reported a prior transurethral prostatectomy in (13.3 %) of his patients[35].

In this study inguinal hernia was an associated problem in 4% of the patients. Hernia repair was done 3 to 4 months after TURP. Agrawal and Kumar (1993) in a study including 83 patients reported inguinal hernia repair simultaneously with TURP in four patients[38].

Devarjan et al (1999) studied 85 patients who underwent combined TURP and hernia repair. He found that the recurrence rate of hernia was 2% and he concluded that: in an experienced hand performing primary hernia repair with TURP is acceptable and has a low complication rate. It is advantageous to the patients in having to under go only one anaesthetic procedure, hospital admission and convalescence beside an effective use of resources[39].

In this study the size of the prostate was estimated by using DRE, U/S and cystoscopy. In 84 patients the size of the prostate as estimated by DRE was less than 40 gm in most of the patients (73.8%). The maximum estimated size was 100 gm.

Young et al (1999) in his survey questionnaire sent to 376 consultant urologist about treatment of benign prostatic obstruction BPO in the UK. Sixty percent of the respondents used the prostate size as a determinant when deciding on therapy for BPO. The most common procedure used was TURP in 79% of patients. The minimum size considered for TURP was 27 ml, and the maximum one was 107ml. Of the methods used to assess the size of the prostate, 86% of surgeons used cystoscopy and 9% used cystoscopy plus TRUS. In the same study he stated that: the DRE plus

cystoscopy (once the decision to use a surgical treatment has been made) will remain the principle methods of assessing prostate size [40].

In the present study preoperative haemoglobin was done for all patients. It was less than 9 gm in 4 patients (4%). Two of these patients had renal insufficiency. All these 4 patients were transfused preoperatively. Also in this study the incidence of urinary tract infection with BPH was reported as 51.5%.

In comparison to a local study done by Kambal (1978), 32.6% out of 367 patients were transfused preoperatively because their hemoglobin was less than 10g. In the same study Kambal found that the incidence of urinary tract infection with BPH was 91.7 %[41].

The current decrease in the incidence of urinary tract infection with BPH may be due to the presence of facilities for early diagnosis, improvement in methods of culture and sensitivity and the introduction of new generations of antibiotics.

Abdominal ultrasound and cystoscopy were used in this study at first for diagnosis then for estimation of the size of the prostate, detection of the lobe affected and looking for abnormal bladder findings. Cystoscopy was performed for 62 patients (62%). The most commonly affected lobe was the median lobe detected in (48.3%) of

the patients. Abnormal bladder findings were detected in (53.2%) and bladder stones were found in eleven patients (17.7%).

Kambal (1978) reported bladder stones were found in 52 patients as associated problem with BPH[41].

BPH appears to predispose to bladder stones as stated by Grosse (1990). He found that bladder stones were about eight times more frequent in the men with histological evidence of BPH at autopsy [42].

In this study history, digital rectal examination (DRE), PSA level and transrectal biopsy were used for defection of carcinoma of the prostate. Carcinoma of the prostate was detected in 3 patients (3%). Holtgrewe (1962) in a study including a series of 2015 patients reported carcinoma of the prostate as15% of his cases [43].

Mubset et al 1989 reported an incidence of 10% of clinically apparent ca prostate[35].

Kirby et al (1994) screened 568 patients aged 55 to 70 years for prostate cancer using DRE, PSA level, TRUS and transrectal biopsy. Prostate cancer was confirmed in 11 patients giving an overall detected prevalence of 2%[44].

In this study the most common indications for TURP were LUTS. Ninety eight percent of the patients came with combination of both irritative and obstructive symptoms. Other indications in combination with LUTS were urine retention occurring in 40% of patients, hematuria in 19%, recurrent UTI in (13%), vesicle stone in 11%, urine incontinence in (3%), adenocarcinoma of the prostate with severe obstructive symptoms in (3%) and renal impairment in (3%).

Mubest et al In his cooperative study of 13 institutions in 3885 patients published in (1989) reported that: The most common indication for TURP was symptoms of prostatism (LUTS), occurring in 91% of patients (he defined prostatism as patients with bladder out let obstructive symptoms, for example decrease in force and caliber of urinary stream, and bladder hyperflexia, for example urinary urgency, frequency, and nucturia). In the same study (70%) of the patients had more than one indications for TURP. Other indications reported in combination with symptoms of prostatism, or alone were significant residual urine in (34.4%) of the patients, urinary retention in (27%), recurrent UTI in (12%), haematuria in (12%), altered urodynamic functions in (9.9%), renal insufficiency in (4.5%) and bladder stone in (3%)[35].

Diabetic and hypertensive patients were evaluated and controlled preoperatively. Four patients were transfused. In this study TURP was done under spinal or epidural anesthesia in (92%) patients and general anesthesia in (8%). All patients received prophylactic antibiotic with induction of anesthesia and no anesthetic complications were reported.

Horninger et al (1996) in study on mortality and morbidity of TURP including 1211patients reported that (91.1%) of all patients were operated under spinal anesthesia, while in (8.9%) general anesthesia were used. All patients received prophylactic antibiotic[45]. Spinal or epidural anesthesia was used in (79%) of all TURP. This result was reported in a national survey study (in USA) done by Holttgrewe et al in (1989). The study including 2716 consultant urologists who responded to the questionnaire conducted[46].

Mubest et al (1989) in his cooperative study reported that (78%) of TURPs were done under spinal or epidural anaesthesia[35].

McGowan and Smith (1980) found, no significant difference between regional and general anaesthesia for TURP, in term of complications blood loss and preoperative mortality [31].

In this study all the procedures were performed by two expert consultant urologists. Post TURP irrigant used was distilled water with continuous irrigation in most of the patients with very low incidences of complications. TUR syndrome was reported in only one patient (1%).

The safety of distilled water for TURP has been evaluated by Shin et al (1991) at department of anesthesiology in Veteran's General Hospital in China. He studied 53 patients, who underwent TURP using distilled water for irrigation with continues drainage. His results showed evidence of fluid absorption, but there was no TUR syndrome reported in his patients. He concluded that: distilled water is relatively safe irrigant fluid for TURP[(28)].

This is also in accordance to the study done by Memon et al (1999) in Pakistan. He evaluated safety of distilled water as an irrigant for TURP, and as a cost–effective alternative. His study included 60 patients. No TUR syndrome has been reported within his patients. He concluded that: Distilled water is a safe irrigant fluid for TURP even with some degree of absorption. Saving for the patient is considerable and this renders the treatment affordable [(27)]. Also the use of modern irrigation fluids (glycine1.5%) in TURP is a great

contributor in lowering the incidence of TUR syndrome. This has been reported by Madersbacher and Marberger (1999) in a study in justification of TURP. They analyzed 29 randomized clinical trial studies (RCTs). The TUR syndrome was reported only in three studies, at 3.4%, 4.7 % and 6.7%. They stated that TUR syndrome has largely disappeared through the use of modern irrigation fluids, improved surgical technique and instrumentation[47].

In this study, additional peroperative procedures were performed in 20% of the patients. The common one was cystolitholapaxy done in 9% the patients followed by urethral dilatation, then DVIU. Agrawal and Kumar (1993) reported an incidence of 12% out of 83 patients who underwent a simultaneous procedure with TURP. The procedures were cystolitholapaxy, inguinal Hernia, or epididymal cyst[38].

The mortality rate reported in this study was 00.0%. Holtgrewe and Valks (1962) reported a mortality rate of 2.5%[43].

Mubest et al (1989) in a large multicenter study on a series of 3885 patients reported a mortality rate of 0.23. They concluded that the mortality has been reduced for transurethral prostatectomy from 2.5 to 0.2 percent during the last 27 years [35].

Thrope et al (1996) reported a post TURP mortality rate of 0.9% out of 1396 patients[48].

Mortality and morbidity of TURP were studied by Horninger et al (1996) in a retrospective study in total of 1211 patients. They reported a mortality rate of 00.0%[45].

In the present study the rate of intraoperative complications was 5%. The only reported intraoperative complication was bleeding occurred in 5 patients (5%). Blood transfusion was required for only 3% of the patients. No TUR syndrome or perforation was reported intraoperatively. In comparison to some other studies: Mubest (1989) reported a rate of intraoperative complications of 6.9%. The most common intraoperative complications were bleeding requiring transfusion in 2.5% of his patients, TUR syndrome in 2%, myocardial arrythmia in 1.1% and extravasaion in 0.9%[35].

Hroninger et al (1996) reported intraoperative complication rate of 8.9%. Bleeding was the most common complication noted in 4.2% of the patients followed by TUR syndrome in 2.8%, cardiovascular problems in 1% and bladder perforation in 0.9%[45].

The rate of early postoperative complications in this study was 13%. The most common early post TURP complication was UTI

occurring in 5% of the patients, followed by urine retention in 3 patients (3%). One of the three patients who presented with urine incontinence preoperatively regained his urine control completely post TURP. The other 2 patients (2%) continued to be incontinent and discharged with condom catheter. TUR syndrome observed in one patient (1%).

Holtgrewe and Valk (1962) published a study on post TURP complications in 2015 patients. They reported a morbidity rate of 18%. The most common early postoperative complications were epididymitis which was observed in 6% of the patients, repeat resection in 3.4%, extravasations in 1.1%, pneumonia in 1.3% and fluid absorption toxicity in 0.41%[43].

Mubest et al (1989) reported post TURP complication rate of 18%. The most common early postoperative complications were failure to void urine observed in 6.5% of the patients, bleeding requiring transfusion in 3.9% clot retention in 3.3% and UTI in 2.3%[35].

Horninger et al (1996) reported a rate of early postoperative complications of 15.8%. The most common early postoperative

complications were urinary retention observed in 7.5%, postoperative bleeding in 3.4% and urinary tract infection 2.4%[45].

Baoum (1997) in a local study including 54 patients reported an early postoperative complications as bacteriuria in (20.4%) of the patients, clot retention in 9.25, epididmorchitis in 5.5%, chest infection in 1.8% and incontinence in 3.7%[7].

Carter et al (1999) reported post TURP complications in a group of 96 patients. The most common early postoperative complications were bleeding requiring transfusion in (5%), UTI in (5%) and acute retention in (2%)[49].

In the present study infection was the most common early postoperative complication occurring in 6 patients (6%).

The role of using prophylactic antibiotics to reduce the incidence of post TURP infection is still a matter of controversy while Scholz (1998) et al and Nielsen et al (1981) reported the beneficial effect of prophylactic antibiotic in reducing the incidence of postoperative infection, Gibbons et al (1978) and Holl and Rous (1982) did not observe any benefits from prophylactic antibiotic in TURP[50,51,52,53].

Mubest et al (1989) reported death of septicaemia in 5 of his patients. Antibiotics were started preoperatively and continued post operatively for 11% of his patients because of evidence of preoperative UTI. Prophylactic antibiotics were given for 61% of his patients[35].

Horninger and his colleagues used to perform TURP under two preconditions only: first the urine culture must be sterile, and second prophylactic antibiotic were administered at least until the indwelling catheter was removed. They considered this as one of the crucial factors contributing to the reduction in the incidence of postoperative septicemia. In their study (1996) no case of septicemia was reported[45].

In this study clot retention was the common early postoperative complication occurring in 2 patients 2%. Both of them developed clot retention after stoppage of post TURP irrigation.

Olapade et al (1998) reported clot retention in six percent of his patients. He concluded that; in most men who undergone TURP, gross heamaturia ceased within 3 weeks and clot retention usually occurs within 2 weeks after surgery. So he recommended high water intake at least for the first 3 weeks post TURP[54].

Agrawal and Kumar (1993) studied 83 patients for early catheter removal following TURP. Five percent of their patients required recatheterization for one day more because of clot retention[38].

In the present study late complications were detected in 62 patients (62%). At follow-up 8 patients (12.9%) presented with irritative symptoms, urethral stricture occurred in (6.45%), recurrence of obstructive symptoms in 4 patients (6.45%) and pain after micturation in one patient (1.61%). Fifteen (71%)out of these 21 patients who developed late post TURP complications showed improvement during follow-up. Sexual dysfunctions can not be determined in this study, since they were not mentioned in the postoperative follow-up records.

In the literature little has been reported concerning long term follow-up and late post TURP complications.

Bruskwits et al in (1986) studied a series of 60 patients to evaluate the late complications. He observed urethral stricture in 5% of the patients and some degree of urge incontinence in 18%. Of the sixty patients how were evaluated 3 years postoperatively, 3 patients noticed persistent pain following the procedure, another 3 patients

were treated for voiding difficulties during follow-up and one patient had an unexplained episodes of haematuria[22]. In comparison to the present study, Bruskuitz reported similar results.

In a local study late post TURP complications reported were urethral stricture in 5.5% of the patients, bladder neck contracture in 1.8% and erectile dysfunction in 13% (Baoum 1997)[7].

Horninger et al (1996) reported a rate of late TURP complications of 11.2%. The most common postoperative complication was UTI observed in 3.4% of the patients, urethral stricture in (3.7%), bladder neck contracture in 1.9% and late postoperative bleeding in (1.7%)[45].

In this study urethral stricture was one of the common late postoperative complications with occurrence rate of (6.45%), in a range of 2 to 8 months after TURP.

In 1977 a study performed by Lentz et al yielded a rate of urethral stricture of (6.3%) at 4-5 months after TURP[55].

A twenty nine randomized clinical trial (RCTs) published between 1986 and 1998 were analyzed by Medersbacher and Marberger in 1999 in a study in justification of TURP. They found that

urethral stricture was one of the major late postoperative complications occurred in a range of 0 -11% with a mean of (3.8%)[47]. A rate of post TURP urethral stricture of 9% in a recent study including 96 patients was reported by Carter et al (1999)[49].

In this study in59% of the patients the catheter was removed within the first 2 postoperative days. The mean duration of post TURP catheterization was 3.2 days. Eighty percent of the patients were discharged within the first 6 postoperative days. The mean duration of hospital stay was 5.7 days. All the patients with immediate postoperative complications had prolonged hospital stay.

Mubest et al (1989) showed that the catheter was removed by the third postoperative day in 82 percent of the patients and 78 percent were discharged from hospital by day 5[35].

In a local study post TURP hospital stay ranged between 3 to 6 days with an average of 4.2 days (Baoum 1997)[7].

Post TURP early catheter removal and its impact on length of hospital stay were studied by KOH et al (1994). He concluded that: removal of the catheter on the first day following TURP is safe in selected patients and leads to shorter postoperative hospital stay[33].

This is also is in accordance with the study done by Dood et al (1995) who studied early catheter removal following TURP in 100 consecutive patients. He found that the hospital stay was significantly shortened in patients with early catheter removal. He concluded that; brief catheter drainage after TURP is safe and allows an earlier discharge from the hospital than standard duration of catheterization[56].

Histopathology results were available in 75 patients. Incidental finding of ca prostate was reported in 5 patients in a rate of (7%). A preoperative PSA level was measured in five patients and it was elevated in four. Transrectal biopsy was taken for 3 patients. The histopathology results were benign in all of them. In comparison to other studies; Horninger et al (1996) reported incidental finding of ca prostate in (7.5%) of the patients[45].

Alfred et al (1982) reported an incidence of incidental ca prostate of 14% in 500 specimen[57].

David et al (1992) found incidental ca prostate in a significant number of TURP specimens (10%)[32].

Conclusion

- Transurethral Resection Of the Prostate (TURP) remains the golden procedure for the effective treatment of BPH.
- This study showed that it was accompanied with very low morbidity and no mortality.
- The postoperative catheterization as well as hospital stay were only few days.

RECOMMENDATIONS

In the Sudan there is shortage of endourology services including TURP facilities. Most of the main hospitals lack facilities of TURP. So the following are recommended:-

1. endourology services including TURP facilities should be available in the main teaching hospitals.
2. Training of general surgeons and registrars to practice endourological procedures including TURP.
3. TURS must be introduced which may help in the accuracy of the diagnosis of BPH, and early detection of ca prostate.
4. Introduction of urodynamics in the urology units can be of great help.
5. A program for health education about BPH for population in general and especially for men above 40 years.
6. A system for continuous orientation and updating information in BPH for doctors at , primary, secondary, and tertiary health care levels.
7. Further study in symptoms prevalence of BPH in the Sudan is needed.

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Appendix

Questionnaire

TURP-Criteria of pt selection, anaesthesia and post OP.

Course in SU.H 1999 - 2003

Serial No. ---------- G.U.C. No ---------- File No.----------

address :---------- D.O.A. ---------- D.O.O----------

(A) Patient selection

Name:- ----------

(1) Age:-

☐ 40 – 60 ys ☐ 61-80 ☐ More than 80

(2) Residence:-

☐ Capital ☐ Town ☐ Village

(3)Material state:-

☐ married ☐ unmarried

(4) Occupation:-

☐ Officer ☐ Worker ☐ Farmer

☐ Business ☐ Retired ☐ Other

(5) Symptoms:-

1- Duration of symptoms

☐ Days ☐ Weeks ☐ months ☐ years

2- presenting symptoms

a- L.U.T.S

A- Obstructive symptoms	B-irritative symptoms
- Hesitancy ☐ yes ☐ No	- frequency ☐ Yes ☐ No
- Dribbling ☐ yes ☐ No	- Dysuria ☐ Yes ☐ No
-weak stream ☐ yes ☐ No	-urgency ☐ Yes ☐ No
- intermittancy ☐ yes ☐ No	- urge incontinence ☐ Yes ☐ No

b-urine retention ☐ yes ☐ No **d- Haematuria** ☐ Yes ☐ No

c-- incontinence ☐ Yes ☐ No **E- others :----** ----------

(6) Past History: -

1- Prostatectomy ☐ Yes ☐ No

If yeas: Type: ☐ Open ☐ TURP Date :----------

- Vesicle stone removal ☐ Yes ☐ No

2- Medical disease

D.M. ☐ Yes ☐ No HTN ☐ Yes ☐ No

Others: - ☐ Yes ☐ No

If yes specify ----------

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(7) PR:-

size of the prostate :-

Normal ☐ Up to 40 gm ☐ 41-60 ☐ >60 gm ☐

Feeling of the prostate : ☐ benign ☐ malignant

(8) Investigation:-

1- Hb : ☐ >9gm ☐ 9-12 ☐ > 12gm

2- Urine analysis

Evidence of Infection ☐ Yes ☐ No

If yes: ☐ frequent ☐ not frequent

3- Blood urea:- ☐ done ☐ Not done

If done: result : ☐ > 50 ☐ < 50

4- P.S.A ☐ done ☐ Not done

If done:

☐ > 4 ☐ 4-10 ☐ 10-20 ☐ >20

5- U/S Prostatic enlargement : ☐ Done ☐ Not Don

☐ Mild ☐ Moderate

☐ Huge ☐ Not mentioned

6- Trans rectal prostatic biopsy

☐ done ☐ Not done

if done result ☐ benign ☐ malignant

(9) Other investigation :----------

(10) Preoperative Diagnosis :

☐ BPH ☐ Ca prostate ☐ doubtful

(11) Pre-operative Diagnostic cystoscopy

☐ done ☐ Not done

If done results :-

1- Prostatic size:

☐ Mild ☐ Moderate ☐ Huge

Lobe affected

☐ Lateral lobe ☐ Median lobe ☐ both ☐ not mentioned

2- U.B. findings:

☐ Normal ☐ Trabiculation ☐ Saculation

☐ Diverticulation ☐ Presence of stone

(B) Anesthesia :

1- preanesthesiatic visit :

☐ don ☐ not don

2- type of anesthesia :

☐ GA ☐ S.A.

3- Complication from anesthesia:

☐ Yes ☐ No

If yes- specify: ----------

(C) Antibiotic:-

☐ Prophylactic ☐ Therapeutic ☐ both

(D) Intera operative Complication :-

1- U.B injery : ☐ Yes ☐ No

2- opening of postatic Capsule :

☐ Yes ☐ No

3- bleeding : ☐ Yes ☐ No

if yes : blood Transfusion : ☐ required ☐ not required

4- TUR syndrome : ☐ Yes ☐ No

(E) other procedures associated within the operative session :

1- urethral dilatation : ☐ Yes ☐ No

2- DVIU : ☐ Yes ☐ No

3- cystolitholapaxy: ☐ Yes ☐ No

4- BNI : : ☐ Yes ☐ No

5- Others : ☐ Yes ☐ No

if yes specify :- ----------

(F) Duration of Catheterization

☐ Up to 2 days ☐ 3-5 days ☐ >5 days

If more than 5 days mention the indication :----------

(G) irrigant and irrigation :

☐ distilled water ☐ others

☐ continuous ☐ intermittent

(H) Post – operative Complications:

[1] Immediate :-

(1) bleeding: ☐ Yes ☐ No

If yes :

Blood transfusion

☐ Required ☐ Not required

(2) TUR syndrome :

☐ Yes ☐ No

(3) Urine incontinence :

☐ Yes ☐ No

(4) clot retention :

☐ Yes ☐ No

(5) Infection:

☐ Yes ☐ No

(6) others : ☐ Yes ☐ No

if yes specify: ----------

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[2] Late complications:

Difficulty in passing urine (stricture)

☐ Yes ☐ No

Others : ☐ Yes ☐ No

if yes specify: ----------

(I) Histopathology result :

☐ Benign ☐ malignant

(J) Hospital stay :

☐ < 4 days ☐ 4-6 days ☐ >6 days

If more than 6days mention the cause: ----------

(K) Remarks : -
